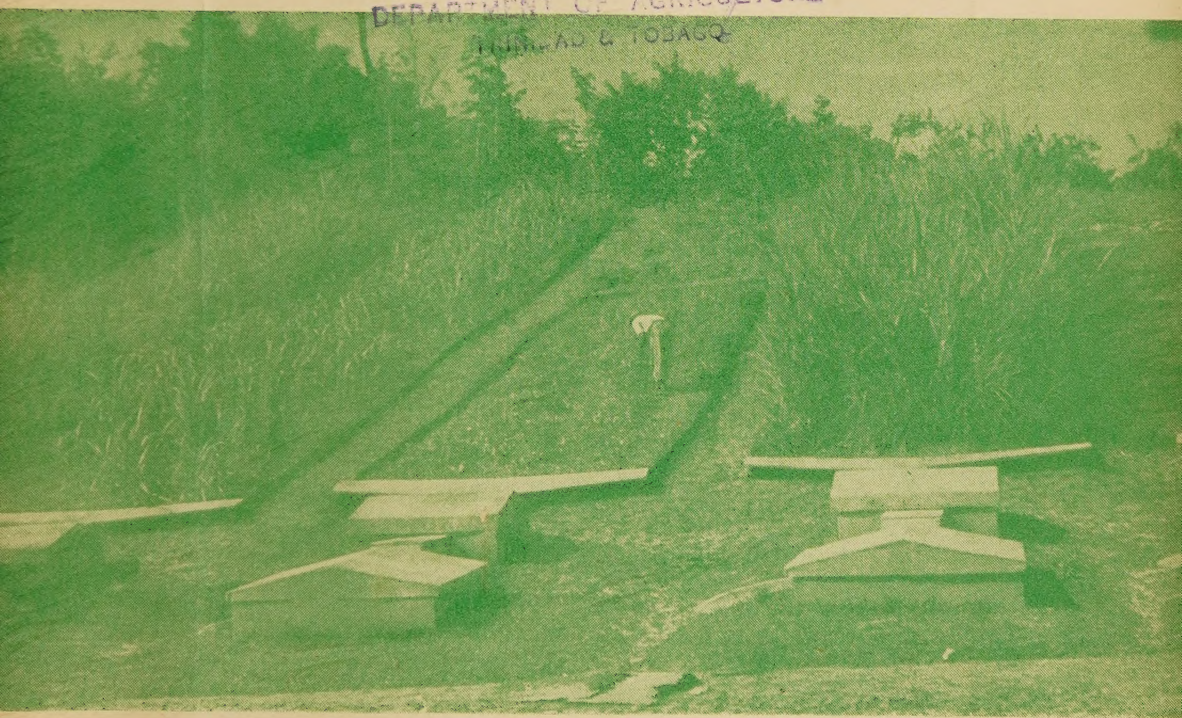
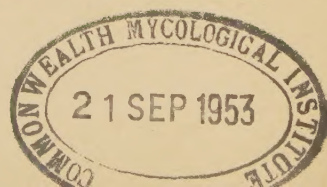


ADMINISTRATION REPORT
OF THE
DIRECTOR OF AGRICULTURE
FOR THE YEAR 1951

WITH THE COMPLIMENTS
OF THE DIRECTOR
DEPARTMENT OF AGRICULTURE
TRINIDAD & TOBAGO



COLONY OF TRINIDAD AND TOBAGO



COVER ILLUSTRATION—Soil Erosion investigations, Central Experiment Station.

Photograph by V. I. Mulloon, Soil Conservation Officer

ADMINISTRATION REPORT
OF THE
DIRECTOR OF AGRICULTURE
TRINIDAD AND TOBAGO
FOR THE YEAR 1951

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DEPARTMENT OF AGRICULTURE, TRINIDAD AND TOBAGO
SCIENTIFIC AND TECHNICAL STAFF

(As at 31st July, 1952)

<i>Director of Agriculture</i>	...	C. HOLMAN B. WILLIAMS, M.A., A.I.C.T.A., D.I.C.T.A.
<i>Deputy Director (Crop Husbandry)</i> ...	...	VACANT
<i>Deputy Director (Animal Husbandry)</i> ...	...	L. R. HUTSON, B.V.SC., D.V.SC.
<i>Chief Scientific Officer</i>	...	B. G. MONTSERIN, Ph.D., M.SC., B.S.A.
<i>Plant Pathologist</i> ...	...	E. B. MARTYN, B.A., A.I.C.T.A.
<i>Agronomists</i> ...	...	D. M. HANSHELL, B.SC., A.I.C.T.A. L. L. DE VERTEUIL, D.I.C.T.A., F.R.H.S. VACANT
<i>Economic Botanist</i> ...	...	L. JOHNSON, B.SC.
<i>Entomologist</i> ...	...	VACANT
<i>Soil Chemist</i> ...	...	VACANT
<i>Rice Officer</i> ...	...	E. G. BENSON, B.SC., A.I.C.T.A.
<i>Agricultural Economist</i>	...	VACANT
<i>Senior Agricultural Officer</i>	...	E. S. CAPSTICK, B.A., A.I.C.T.A.
<i>Agricultural Officers</i> ...	...	F. D. DAVIES G. P. BLAIR, M.SC., B.SC., D.I.C.T.A. J. F. BELL, B.SC. R. BARRIE-SMITH, B.SC., Dip. Agric., D.T.A. C. A. S. HYNAM, D.I.C.T.A.
<i>Marketing Officer</i> ...	...	V. O. FERRER, M.SC., D.I.C.T.A., F.R. Econ. S.
<i>Soil Survey Officers</i> ...	...	G. C. WITT, B.SC., A.R.C.S. C. B. BROWN, B.SC.
<i>Veterinary Officers</i> ...	...	T. A. DES ILES, D.V.M., Dip. Agric. HOLMAN E. WILLIAMS, D.V.M., M.SC. F. O. GONZALEZ, M.R.C.V.S., B.SC., D.I.C.T.A. H. V. M. METIVIER, O.B.E., I.S.O., M.R.C.V.S., B.SC. (Special duties) J. L. SHANNON, D.V.M. (Temporary)

<i>Land Settlement Supervisor</i>	...	P. O. M. HOSTEN
<i>Superintendent, Public Gardens, Grounds and Pastures</i>	...	I. HOSEIN, B.SC., D.I.C.T.A.
<i>Manager, St. Augustine Station</i>		R. ROSS
<i>Senior Agricultural Assistants</i>	...	S. E. HAGLEY
		V. I. MULLOON, D.I.C.T.A.
		D. M. FARRELL
		A. E. JOSEPH
		R. MOOSAI-MAHARAJ, D.I.C.T.A.
		V. C. R. HENRY, D.I.C.T.A.
		E. J. HAMILTON, M.SC., D.I.C.T.A.
		P. J. DOMINIQUE
		T. O. PHILLIPS
		2 VACANT
<i>Agricultural Assistants</i>	...	H. H. BEACH, D.I.C.T.A.
		C. A. FORDE
		R. E. GREAVES
		W. O. BISHOP, D.I.C.T.A.
		I. E. TELFER, D.I.C.T.A.
		W. A. McMILLAN
		S. BHARATH
		G. KHAN, dip. Agric.
		S. REDMAN, D.I.C.T.A.
		E. L. ITON
		M. A. LA CHAPELLE, B.SC.
		F. RAPHAEL
<i>Manager, Tobago Farm</i>	...	A. N. XAVIER
<i>Stock Inspectors</i>	...	D. MACFARLANE
		L. PREUDHOMME
		H. MOHAMMED
		G. HARNANANSINGH
<i>Assistant Fishery Officer</i>	...	CAPT. R. E. HUNT
<i>Fish Culturist</i>	...	VACANT
<i>Inspector of Apiaries</i>	...	E. A. EMOND

In addition there are 16 Field Assistants, Grade I
68 Field Assistants, Grade II
2 Senior Laboratory and Field Assistants
3 Scientific Assistants
2 Junior Scientific Assistants

COCOA BOARD

Chief Rehabilitation Officer ... E. R. MOLL, B.Sc., D.T.A.

*Officer-in-Charge, La Pastora
Propagating Station* ... P. C. SCANTLEBURY

*Officer-in-Charge, King's Bay
Propagating Station* ... E. A. BLACK

*Officer-in-Charge, Marper
Propagating Station* ... C. A. PHILLIPS

In addition there are 10 Field Assistants, Grade I
10 Field Assistants, Grade II

MARKETING BOARD

Assistant Marketing Officers ... L. C. FARRELL
F. A. RAWLINS

Senior Marketing Assistants ... W. A. FLOOK
F. A. BAIN

Marketing Assistants J. FERNANDES
J. GONSALVES
C. HUTCHINSON
A. U. MASSIAH

In addition there are 6 Depot Assistants, Grade I
13 Depot Assistants, Grade II

INTRODUCTION

ABNORMALLY wet weather was experienced throughout the year; there was virtually no dry season and flood damage to crops, roads and bridges was considerable. Adversely affected by the weather were sugar, citrus, vegetable crops and maize. Swamp rice suffered severely from flooding and poor yields resulted from late planting. Cacao, coconuts, coffee and bananas appeared not to have been affected by prevailing conditions. There was an increase of approximately 20 per cent. in the cacao crop as compared with the 1950 production.

Labour conditions were mostly fair and marked by only a few periodical shortages, chiefly in fishing districts and in areas where large-scale construction work was being carried out. There were minor strikes in the south-west of Trinidad affecting coconut estates.

There was a marked increase in the use of mechanical equipment by peasant farmers, notably in rice and sugarcane areas. In most instances the sugar estates and private contractors have provided equipment and operators for ploughing, rotary hoeing, &c., at fixed rates which have appealed to peasant farmers.

Praedial larceny continues to be a serious problem. Thefts are no longer casual or prompted by poverty and lack of food, but are organized on a large scale with motorized transport and extended to include export crops and fertilizers on estates.

AGRICULTURAL POLICY

While the recommendations of the Agricultural Policy Committee are being followed, a very important contribution to agricultural policy was provided, towards the end of the year, by the Interim Report of the Local Food Production Committee. This report received the endorsement, in principle, of the Legislature which provided funds for its implementation. The recommendations of the Committee are reproduced below.

GENERAL

(1) Optimum use of the land for the purpose to which it is best suited, to be the basic condition of the measures to be pursued.

(2) Increase in local food production to be undertaken as an integral part of a long-term project aimed at placing all phases of local agriculture at the highest sustained potential, while ensuring that, in case of a shipping crisis, adequate food would be available.

(3) The agricultural education of the rural population to be a major function of the Extension Division of the Department of Agriculture.

(4) Complete self-sufficiency in all respects not being a sound objective, either economically or sociologically, and the increase of exports being essential for maintaining the rising standard of living of the growing population, a proper balance to be maintained between production for local consumption and production for export.

(5) The scope of the Agricultural Credit Bank to be widened to enable loans to be issued for fisheries development and for the manufacture or processing of agricultural or fishery products.

LEGISLATION AND ITS ENFORCEMENT

(6) Controls on the prices of locally-grown foods, of vegetable, animal and fish origin, to be removed; in the case of vegetable products, adequate notice to be given so that growers may produce in anticipation of the date.

(7) Permanent legislation on praedial larceny to be enacted to provide—

- (i) That it is an offence for a person to be found on cultivated lands, or entering or leaving same, without lawful excuse or the permission of the occupier or owner of such lands;
- (ii) That occupiers, or their servants, may arrest persons infringing as at (i) above;
- (iii) That drivers of motor vehicles transporting agricultural produce be obliged to carry a way-bill or a record book, in a simple form showing the quantity and description of the produce being transported, its origin and destination;
- (iv) Minimum penalties for the infraction of the provisions of the legislation.

(8) Copra to be added to the list of "licensable produce" in the Sale of Produce Ordinance, Ch. 23. No. 17, and the provisions of the Ordinance, especially in respect of dealing in licensable produce only at licensed premises to be strictly enforced.

(9) The Income Tax legislation and/or its application be amended to provide that expenses incurred in the following instances receive the treatment indicated:—

- (i) Replanting a given area with the same or a new variety of crop or crops.

The annual expenditure in such cases, which normally takes place over a period of years, should not be regarded as capital expenditure. It is properly a maintenance charge and should be allowed as a deduction for the purposes of income tax.

- (ii) Preparing for and establishing orchard or tree crops on land which is abandoned or has never been cropped.

The expenditure incurred in these operations should be the subject of an income tax remission designed to enable the expenditure (which will be unremunerative for several years) to be written off the profits derived from the area over a reasonable period. The Committee proposes a period of ten years because it is unlikely that any appreciable revenue will be derived from such crops (e.g., cacao, coconuts, citrus), for the first four to five years.

- (iii) Expenditure on rebuilding or effecting repairs to buildings used for (a) housing agricultural labour and (b) drying and processing agricultural produce.

The considerations are exactly the same as for item (i) above and the recommendation is the same.

- (iv) Expenditure on new buildings for housing agricultural labour and for drying and processing agricultural crops should be subject to a remission as at (ii) above.

(10) The slaughter of heifers and cows, under ten years of age and not condemned by a Government Veterinary Officer, to be prohibited and the prohibition strictly enforced.

(11) A much wider range of responsible persons to be empowered to issue permits for setting fire and their names and addresses to be fully publicised.

(12) A much wider range of responsible persons to be appointed Members of Fire-Vigilance Committees and Officers of the Agricultural Department to be included in the list in Section 18 (1) of Ordinance No. 11 of 1942.

(13) Legislation to be enacted which will provide for a wider range of bodies to be registered than that permitted under the existing Co-operative Ordinance which only provides for *Agricultural* societies (fishermen's co-operatives, for example, being excluded under the present law):

(14) Measures to be taken to enforce the existing legislation in regard to the sizes of mesh used in fish nets and seines.

(15) The existing legislation on the rental of agricultural land, which is now worded and interpreted discourages private proprietors from renting lands, to be reviewed and amended so that unused land may be more readily rented for short periods.

(16) Authority to be conferred upon the appropriate officer of Government empowering him to limit the importation of "white" or "Irish" potatoes at periods of maximum production of local starchy foods.

(17) Limitation of the movement of animals to and from Tobago, except in so far as may, at times, be required as a quarantine measure, to be entirely removed. (Tobago should be regarded as an integral part of the Colony analogous to Cedros and no more remote).

(18) The rebate of the tax on gasoline, which is now restricted to the operation of tillage, to be extended to those of weeding, underbrushing, harvesting (including forage harvesting), binding and threshing, but not haulage, and to the fuel used by the engines of commercial fishing craft.

PROVISION AND UTILIZATION OF LANDS

(19) The policy in regard to Crown Lands should be one of orderly and progressive development based on the following general principles:—

- (i) Lands to be used for the purpose to which they are best suited;
- (ii) Lands to be leased and not sold;
- (iii) Leases to be of a probationary type at first, to be followed, if the tenant prove satisfactory, by a long-term renewable lease;
- (iv) All leases to embody an approved and agreed-on programme of work and development; the execution of which will be a condition of continued tenancy;
- (v) The rate of alienation to be strictly co-ordinated with the Staff available for inspection, both initial and periodic, recording, mapping, &c.;
- (vi) Shifting cultivation to be avoided and emphasis placed on permanent long-term residential occupation;
- (vii) Size of holding to be such that, as a minimum, wholetime occupation be provided for the lessee.

(20) Where land is available in the vicinity of towns or large villages, a limited number of allotments to be made available for employed workers who wish to grow their own food.

(21) Private Interests to be encouraged to bring the maximum acreage into cultivation by action under the following recommendations:—

Acceleration of Cacao Rehabilitation

Income Tax Concessions

Removal of Price Controls

Control of Praedial Larceny, and

Amendments to the Control of the Rents of Small Agricultural Holdings Ordinance.

(22) The Land Settlement plan for the next five years to be pursued, care being taken to equate land settlement projects to the Agricultural Staff available for supervision, it being beyond the slightest doubt that such projects can only succeed where strict enforcement of the best agricultural practices prevails.

(23) The wage-earning public, as distinct from professional farmers, to be encouraged by propaganda and advice to utilise their backyards and gardens for growing some portion of their food, vegetable or animal.

(24) Government Departments and Private Occupiers to be encouraged to plant trees which produce some sort of food (breadfruit, mango, coconut, &c.), on all idle land and when, for purposes of controlling soil erosion, or for windbreaks, shade, &c., it is desirable to plant a tree or trees.

(25) Government to accelerate the provision of additional rice lands and the amelioration of drainage and irrigation on existing rice areas, as may be recommended by the Standing Rice Committee.

UNITED STATES BASES

(26) If and when these areas come under Government control, it is recommended that:—

- (i) Areas now under permanent crops be rehabilitated and maintained;
- (ii) The more fertile areas of Waller Field be rented as food allotments;
- (iii) The Forestry Department control areas in forest;
- (iv) The Agricultural Department, and private enterprise under its supervision, experiment on the less fertile soils of Waller and Carlsen Fields with a view to their ultimate utilization;
- (v) Suitable areas of Carlsen Field revert to sugarcane cultivation.

ANIMAL HUSBANDRY

(27) Government to invest \$450,000 in the purchase and erection of a building and plant for converting citrus waste into a stockfeed ingredient. The plant to be erected, operated and managed by the Co-operative Citrus Growers' Association (on the lands of the Association) which would bear all expenses except interest, depreciation and the cost of fuel, and hand over the entire output to Government (the Marketing Board) in bulk 3.5 cents per lb. (this figure being subject to adjustment to cover any increase in operating and maintenance cost), during a period of approximately eight years, and until the value of the product so delivered shall have offset the original investment, the cost of fuel used, depreciation and interest. At the close of the transaction, the plant to remain the property of the Co-operative Citrus Growers' Association.

(28) The Department of Agriculture to suspend the sale of female stock (more especially cows) for one or two years so as to increase its herds permanently, thus ensuring a marked increase in the numbers offered for sale, annually, thereafter.

(29) The Department of Agriculture to purchase 25 buffalo heifers, locally, and from abroad, 200 cows, 100 sows, 100 ewes, 100 does and 300 hens, for the production of increased numbers of progeny for sale to the public.

(30) The Department of Agriculture to add three Junior Livestock Inspectors to its Staff and to take measures to enforce strictly the regulations prohibiting the slaughter of fertile cows.

(31) The Department of Agriculture to be allocated a revolving fund of \$10,000 to be used:—

(i) for the purchase of fertile cows whose sale for slaughter has been stopped;

(ii) for the importation of breeding stock for stockmen who place firm orders.

(32) Operators of large estates to be invited to grow, as a minimum, the feed needed for their own herds.

(33) The Marketing Board to increase the number of points at which it sells stockfeeds and its publicity in regard to same; to purchase molasses at the rate agreed on for local distilleries (thus ensuring an unlimited supply) and to sell same in its various depots.

(34) The Department of Agriculture, or private interests under its control, to test the feasibility of establishing pastures on the less fertile soil types of the former American Bases (when Government shall have received recontrol of same) and to make recommendations on the results of the experiments.

(35) The Department of Agriculture to be provided with an additional Veterinarian.

(36) Veterinarians of the Department of Agriculture to undertake private work, on a fixed scale of fees, on farm animals (domestic pets excluded) located more than 20 miles from the home of an active private Veterinarian, and to pay the fees earned into Revenue.

(37) Government Veterinarians, undertaking private practice, to be paid a fixed non-pensionable allowance and provided with a revolving fund of \$500 for drugs.

(38) The Department of Agriculture to establish six additional breeding units in 1952, and to be allowed to let out their construction on contract.

(39) If two milk processing plants are to be established in the Colony, consideration to be given to one of them being set up in Tobago.

(40) Funds to be provided for the expansion and modernisation, in stages, of the stockfeed mixing plant at St. Joseph.

CROP HUSBANDRY

(41) The Cocoa Board to be invited to accelerate rehabilitation by:—

- (i) Erecting more propagating units (with a capacity of 5,000 plants upwards) on private lands;
- (ii) Increasing the percentage of the total area eligible for rehabilitation grants beyond the 10 per cent. now allowed;
- (iii) Substantially increasing the amount of 10 cents per plant at present allowed per tree planted in areas in excess of those eligible for a full rehabilitation grant.
- (iv) Importing banana plants for sale to peasant growers.

(42) The Department of Agriculture to increase its area under local food crops, at the Central Experiment Station and the Demonstration Stations, by 70 acres for the provision of planting material for sale.

(43) The Marketing Board to increase and expand its depots and activities as well as its propaganda in regard to:—

- (i) The sale of seeds, planting material, fertilizers, insecticides and cartridges;
- (ii) The purchase of food in areas of high production and its resale in areas of low production.

Detailed proposals will be submitted.

(44) The Marketing Board intensively to publicise its guaranteed minimum prices for locally-grown foods, revising the figures annually and keeping them as high as market conditions may permit, and to offer short-term maximum guarantees when conditions warrant.

(45) The Department of Agriculture to consider, in the light of results obtained from a drive now in progress in Tobago, the advisability of purchasing a stock of guns and organising drives against vermin and crop-destroying birds in specific areas and at specific times.

(46) The Forestry Department to increase the area of Government teak plantations by 200 acres a year with a view to a permanent addition (2,000 acres in 10 years) to the country's capital assets and an increase in annual food production, the new lands to be split up between two to three zones.

FISHERIES

(47) Proposed legislation for organizing, assisting and controlling the Fishing Industry to be enacted, but provision for loans to be excluded therefrom (loans, as distinct from grants, should be dealt with through the established lending agency of the Agricultural Credit Bank).

(48) Additional depots and refrigerated trucks to be equipped by the Marketing Board for its important function of distributing and marketing fish.

(49) The appointment of a fully-qualified Fishery Officer, and his equipment with the means of studying the various aspects of the industry and improving the techniques of fishermen, to be accelerated.

(50) The organizations, investigating the possibility of introducing modern techniques to the local fishing industry to be given every possible facility.

LOANS ADMINISTERED THROUGH THE AGRICULTURAL CREDIT BANK

(51) The sum of \$2,115,000 to be provided for augmenting the lending activities of the Bank, this total being sub-allocated as follows:—

For the development and expansion of agricultural co-operatives	...	...	...	...	\$ 250,000
For the development and expansion of fishery co-operatives	...	...	...	...	90,000
For initiating mechanical schemes of agricultural production	...	...	...	...	25,000
For short-term loans to manufacturing agricultural co-operatives	...	...	...	...	300,000
For processing of citrus offals	...	...	...	...	450,000
For increasing the normal unspecified lending functions of the Bank	...	...	...	...	1,000,000
Total					\$2,115,000

AGRICULTURE IN THE COLONY

GENERAL CONDITIONS

2. The annual rainfall for a number of selected stations throughout the Colony and the monthly means for 1951, as well as for a 20-year average, are given in Tables I and II. These data, which have been kindly supplied by the Hydrologist of the Works and Hydraulics Department, show that the rains were continuous and abnormally heavy in 1951.

TABLE I—ANNUAL RAINFALL, TRINIDAD AND TOBAGO

Station	Total 1951, inches	20-Year Mean, inches
<i>North Trinidad</i>		
River Estate, Diego Martin	111.79	82.03
St. Clair, Port-of-Spain	93.15	68.31
La Pastora, Santa Cruz	97.13	88.76
I.C.T.A., St. Augustine	114.24	71.91
Meteorological Station, Piarcó	95.10	73.30
Frederick Estate, Caroni	92.55	87.74
Torrecilla Estate, Arima	129.42	—
Works and Hydraulics, Toco	80.99	81.48
Hollis Reservoir, Valencia	138.76	128.70
Bowline Estate, Sangre Grande	150.49	133.01

TABLE I—ANNUAL RAINFALL, TRINIDAD AND TOBAGO—*Contd.*

Station					Total 1951, inches	20-Years Mean, inches
<i>Central Trinidad</i>						
Waterloo Estate, Waterloo	...	...	...	...	83.83	68.90
Todds Road Estate	...	...	...	...	104.23	78.53
Tamana Teak Plantation	...	...	...	...	135.76	120.78
McBean Estate, Couva	...	...	...	...	84.76	67.34
Forres Park Estate, Claxton Bay	...	...	...	...	83.74	61.91
New Lands Estate, Biche	...	...	...	...	141.08	116.53
Marper Farm, Manzanilla	...	...	...	...	135.38	105.16
Brasso Tamana	...	...	...	...	137.78	102.40
Cocal Estate, Nariva	...	...	...	...	39.92	—
<i>South Trinidad</i>						
Brothers Estate, Williamsville	...	...	...	...	87.82	85.07
Usine Ste. Madeleine, San Fernando	...	...	...	...	90.92	75.68
Perseverance Estate, Cedros	...	...	...	...	71.85	59.90
Poole Syndicate, Rio Claro	...	...	...	...	128.54	112.23
Point Fortin Filtration Plant	...	...	...	...	101.24	87.70
T.L.L., Barreckpore, Penal	...	...	...	...	98.11	75.74
Mayaro Police Station, Mayaro	...	...	...	...	116.81	96.17
Moruga Police Station, Moruga	...	...	...	...	80.72	72.21
T.L.L., Guayaguayare	...	...	...	...	109.76	88.72
Siparia Old Road, Fyzabad	...	...	...	...	93.75	65.38
<i>Tobago</i>						
Botanic Gardens	...	...	...	...	87.46	87.49
Government Farm	...	...	...	...	85.47	74.43
Friendship Estate	...	...	...	...	108.66	—
Hermitage Estate	...	...	...	...	72.18	97.45
Green Hill Estate	...	...	...	...	94.56	—
Kendal Estate	...	...	...	...	180.64	—

TABLE II—MEAN MONTHLY RAINFALL, TRINIDAD AND TOBAGO

Month					1951, inches	20-Year Mean, inches
January	...	...	...	...	8.95	6.24
February	...	...	...	...	13.84	5.12
March	...	...	...	...	5.50	2.84
April	...	...	...	...	2.64	3.26
May	...	...	...	...	7.25	5.84
June	...	...	...	...	14.86	12.62
July	...	...	...	...	9.36	10.01
August	...	...	...	...	9.22	11.32
September	...	...	...	...	9.71	6.64
October	...	...	...	...	7.05	6.86
November	...	...	...	...	11.28	8.46
December	...	...	...	...	8.65	8.90
TOTAL	...	...	...	...	108.31	88.11

3. There were general increases in wages in all the agricultural industries by private enterprise as well as Government. At the beginning of the year the wages of all day, time, piece and task workers in the sugar industry were increased by 25 per cent. on the 1949 rates. Proposals by the workers' representatives on the Wages Council for the Sugar Industry for an increase in wages for 1952 were under consideration at the end of the year.

AGRICULTURAL PRODUCTS FOR HOME CONSUMPTION

Crops.

4. Increased interest in the production of green vegetables continued although unfavourable weather during the main growing season caused severe damage to these crops. The output was consequently restricted and inadequate to meet local needs. Starchy vegetables, however, were not so seriously affected and supplies were satisfactory.

5. The production of maize was less than usual, due to the absence of a "dry" season. Conditions were generally favourable for hill rice and yields were satisfactory. A large area was planted to swamp rice but heavy rains caused delay in preparation and planting while floods occasioned severe losses. Yields were fair where earlier stands could be established but, for the most part, lower than in previous years.

6. Beans and peas, largely grown in lagoon areas, were practically non-existent. In other market gardening areas, either flooding or the long rainy spells during the "dry" season depressed production considerably.

Livestock

7. *Supply of Feeding Stuffs.*—Corn was again in short supply due to unfavourable weather conditions, and this necessitated considerable importations from British Guiana and British Honduras to meet local demands. The price of coconut meal was increased from $2\frac{1}{2}$ to 5 cents per pound during the year. There was a substantial consumer resistance to this increase with the result that stocks accumulated and licences had to be issued for export of quantities of this commodity. Rice bran was available in satisfactory quantities from local sources and formed a valuable ingredient in feeds prepared by the Marketing Division. High protein feeds were in short supply; cotton seed meal was not obtainable. Towards the end of the year, supplies of molasses were insufficient for the preparation of stock feeds by the Marketing Division.

8. *Meat and Milk Production.*—No accurate data on meat production are available and it is known that appreciable numbers of small stock (pigs, goats and sheep) and poultry are slaughtered privately. The year's figures for animals slaughtered at Municipal and Government-controlled abattoirs show that 23,860 cwt. (1,190 tons) of beef and veal and 14,090 cwt. of pork (704.5 tons) were produced. As with meat, complete production figures for milk are not available, but returns from 17 of the larger dairies show that they handled 34,352 gallons per month. The occurrence of outbreaks of poultry diseases as listed in paragraph 143 adversely affected the supply of birds and eggs.

9. *Importations.*—The animal imports are listed in Table III.

TABLE III—ANIMALS IMPORTED INTO TRINIDAD, 1951

Type	Source					No.	Total
<i>Animals for Slaughter</i>							
CATTLE	...	...	British West Indies	...	...	164	164 4,788 2,810 2,078
GOATS	...	...	British West Indies	...	...	4,788	
SHEEP	...	...	British West Indies	...	...	2,810	
SWINE	...	...	British West Indies	...	...	2,078	
<i>Animals for Breeding and Work</i>							
CATTLE	...	...	Dutch West Indies	...	...	2	8
			British West Indies	...	...	6	
GOATS	...	...	British West Indies	...	...	76	76
SHEEP	...	...	British West Indies	...	...	142	142 57 69 70
SWINE	...	...	British West Indies	...	...	31	
			United Kingdom	...	...	1	
			Canada	...	...	25	
HORSES	...	...	United Kingdom	...	...	36	69
			Ireland	...	...	2	
			Canada	...	...	11	
			British West Indies	...	...	20	
ASSES	...	...	British West Indies	...	...	67	70
			Venezuela	...	...	3	
MULES	...	...	United States of America	...	...	326	413
			British West Indies	...	...	44	
			Venezuela	...	...	3	
			Santo Domingo	...	...	40	

10. The imported fresh meat supply of the Colony was again chiefly from New Zealand and Australia in the form of frozen meat and is summarized as follows:—

Fresh, chilled or frozen beef and veal

	cwt.	cwt.
United Kingdom	540	
Australia	37,412	
New Zealand	3,030	
United States of America	40	
Argentine	891	
British Guiana	1,121	43,034

Fresh, chilled or frozen mutton and lamb

	cwt.	cwt.
Australia	388	
New Zealand	4,095	
Argentine	40	4,523

Fresh, chilled or frozen pork

				cwt.	cwt.
Australia	...	...	...	326	
New Zealand	...	...	...	1,237	
Argentina	...	...	...	16	1,579

Apiculture

11. There were 206 registered apiaries at the close of the year with a total of 2,768 colonies. Weather conditions were not favourable to honey production and, in most areas, the yields were not considered good. Production returns for the year were 21,085 lb. of honey and 595 lb. of beeswax.

AGRICULTURAL EXPORTS IN 1951

12. There were substantial increases in the value of most of the principal crops. A comparison of the increasing value of exports of agricultural products over the past five years follows:—

Year	Total Value
1947	\$16,872,844
1948	26,806,254
1949	28,376,869
1950	33,737,832
1951	38,458,508

13. The quantity and value of various agricultural exports are shown in Tables IV and V, the data for which were kindly supplied by the Government Statistician.

TABLE IV—AGRICULTURAL EXPORTS, TRINIDAD AND TOBAGO, 1951

Item	Quantity	Value	Value
<i>Sugar and By-Products</i>			
Sugar (unrefined)cwt. ...	2,342,646	\$19,310,321.00	
Sugar (refined)lb. ...	248,164	57,458.20	
Molasses (Inedible)cwt. ...	84,600	135,360.00	\$19,503,139.20
<i>Cacao</i>			
Beanscwt. ...	172,470	11,563,269.90	
Butterlb. ...	6,369	4,918.50	11,568,188.40
<i>Citrus</i>			
Lime Juice (raw)liq. gal. ...	50,817	53,248.00	
Lime Juice (concentrated), ...	100	801.60	
Limeslb. ...	18,729	1,412.50	
Grapefruit, ...	7,030,725	406,289.20	
Oranges, tangerines and mandarines, ...	2,788,745	143,159.20	
Grapefruit Juiceliq. gal. ...	658,135	839,781.80	
Orange Juice, ...	19,459	34,669.60	1,479,361.90
Carried forward ...			

TABLE IV—AGRICULTURAL EXPORTS, TRINIDAD AND TOBAGO, 1951—Contd.

Item	Quantity	Value	Value
Brought forward			
<i>Tonca Beans</i>lb. ...	20,962	\$ 23,648.20	\$ 23,648.20
<i>Rubber (raw)</i>lb. ...	191,813	190,918.00	190,918.00
<i>Coffee (raw)</i>cwt. ...	13,022	1,042,367.90	1,042,367.90
<i>Coconut Derivatives</i>			
Coconut Oil (unrefined) ...liq. gal. ...	109,083	201,178.30	
Coir Fibrelb. ...	218,522	19,977.30	221,155.60
<i>Fresh Vegetables</i>lb. ...	441,719	92,120.50	92,120.50
<i>Fresh Fruits, Other Sorts</i>lb. ...	368,214	59,951.60	59,951.60
<i>Bananas</i>lb. ...	4,946,175	225,902.10	225,902.10
<i>Peas and Beans</i>lb. ...	450	95.40	95.40
<i>Livestock and Hides</i>			
Live animals other than for foodlb. ...	—	89,481.70	
Live animals chiefly for foodlb. ...	—	6,531.00	
<i>Hides</i>lb. ...	135,385	40,815.70	136,828.40
<i>Milk, Fresh</i>lb. ...	23,297	3,312.70	3,312.70
<i>Spices</i>			
Nutmeglb. ...	36,501	13,480.00	
Macelb. ...	1,440	1,708.30	
Other Spiceslb. ...	5,780	2,593.60	17,781.90
TOTAL VALUE			\$34,564,771.80

TABLE V—EXPORTS OF MANUFACTURED AGRICULTURAL PRODUCTS, TRINIDAD AND TOBAGO, 1951

Item	Quantity	Value	Value
<i>Sugar and By-Products</i> ...			
Rumproof gal. ...	2,432,407	\$2,313,252.80	\$2,313,252.80
<i>Syrup</i>lb. ...	1,727,001	62,707.00	62,707.00
<i>Citrus</i>			
Lime Oil (distilled)lb. ...	8,687	109,748.00	109,748.00
<i>Coffee (prepared)</i>lb. ...	54,653	53,931.00	53,931.00
<i>Wine</i>			
In bottlegal. ...	15,438	27,148.50	
In woodgal. ...	7,274	7,086.50	34,235.00
<i>Coconut Derivatives</i>			
Coconut Oil (refined) ...liq. gal. ...	100,625	238,134.80	
Margarine (animal, vegetable or mixed)lb. ...	256,538	102,479.30	
Lardlb. ...	153,050	59,411.50	400,025.60
<i>Soap</i>			
Hard Soaplb. ...	1,140,874	188,358.50	
Stock Soaplb. ...	40,049	6,007.30	194,365.80
<i>Bitters...</i>liq. gal. ...	66,430	721,946.90	721,946.90
<i>Jam, Marmalade and Fruit Jellies</i> lb. ...	16,188	3,524.10	3,524.10
TOTAL VALUE			\$3,893,736.20

Sugar

14. The major facts concerning the 1951 sugar crop are presented in Table VI. The decrease in output is mainly attributable to unfavourable weather during harvest.

TABLE VI—TRINIDAD SUGAR CROP STATISTICS

	1951	1950
Estates' canes ground, tons	945,634 (66.00%)	885,818 (63.19%)
Farmers' canes ground, tons	487,099 (34.00%)	516,113 (36.81%)
Total canes ground, tons	1,432,733	1,401,931
Sugar output, tons	140,668	146,508
Tons cane per ton sugar	10.19	9.57
Estates acreage reaped	28,316	31,322
Average Estate cane yield per acre, tons	33.40	28.28
Estimated tonnage standover canes:		
Estates	103,150	9,901
Farmers	25,602	300
Price of Farmers' canes per ton	\$7.99	\$7.77

15. Lengthy negotiations were carried on during the year for completion of details of the Commonwealth Sugar Agreement and the price for export sugar in 1952. An agreement was drawn up towards the end of the year setting out the quantities allotted to the various sugar producing territories. Under this agreement the quota allotted to the British West Indies was 900,000 tons of which 670,000 tons will be purchased by the United Kingdom Government at reasonably remunerative prices. Trinidad's share of these amounted to 157,850 tons and 124,578 tons, respectively. The price of export sugar of the 1952 crop was increased by £5. 12s. 6d., making the price £38. 10s. 0d. per ton, c.i.f.

Cacao

16. The crop was below expectations, due to poor weather conditions and the resulting incidence of disease, particularly Black Pod. Nevertheless, exports of raw cacao amounted to 19,316,640 lb. as compared with 16,197,928 lb. in 1950.

17. Good prices have led to increased maintenance and the clearing of abandoned estates. Considerable interest has been shown in cacao rehabilitation. New clonal plantings are coming into bearing and, with improved maintenance and disease control, prospects are favourable.

18. Exports and value of raw cacao for the last five years were as follows:—

TABLE VII—EXPORTS AND VALUE OF RAW CACAO, TRINIDAD AND TOBAGO

Year	Exports	Value
	lb.	\$
1947	9,009,644	3,205,049
1948	18,285,605	8,353,312
1949	12,831,728	4,519,207
1950	16,197,928	8,360,678
1951	19,316,640	11,563,270

Coconuts

19. Crops have been generally satisfactory, but loss of trees from diseases and pests has been rather more extensive than usual. The value of exports of coconut derivatives amounted to \$621,180 as compared with \$651,507 in 1950.

20. Maintenance work has been generally of a high standard and the use of machines is increasing. Power-driven brush cutters have become popular on the larger estates, and rotary hoes are used fairly widely. The practice of cover-cropping is being extended slightly, Tropical Kudzu being the most favoured crop. Red Ring disease has been particularly destructive to young trees in the eastern and north-eastern coastal areas, while Bronze Leaf Wilt has been in evidence mainly on the heavier soils.

Citrus

21. The grapefruit and orange crops were affected by the heavy rains causing dropping and spoilage, while flooding and waterlogging caused setbacks in some areas. The acreage planted to citrus continued to expand, due mainly to replacement of cacao under the Cacao Rehabilitation Scheme. The value of exports of citrus products was \$1,589,110 as compared with \$2,206,438 in 1950.

22. The Co-operative Citrus Growers' Association produced 284,120 cartons of juice, and exported 83,428½ cases of fresh fruit. Of the juice produced, 220,473 cartons were exported and 51,768 cartons were consumed locally.

23. Orange and grapefruit cultivations remained in healthy conditions, and new plantings continued at an estimated rate of 400 to 500 acres per year. There was a very distinct trend to greater planting of oranges rather than grapefruit. This was due to uncertainty as to future grapefruit prices and the fact that oranges are better suited to areas of high rainfall.

24. Production of limes diminishes as seedlings decline from epidemic root disease. Replanting with budded limes is in evidence, but will be severely limited, for some time to come, by insufficient supplies of plants. The Dominica Wild Grapefruit appear to be pre-eminently the most suitable rootstock for budded limes, but adequate supplies of seeds were difficult to obtain. It appears probable that lime production will slowly diminish for the next four or five years, and then increase gradually as budded plantings come into bearing. In consequence of the short crop, prices for limes were very attractive.

Other Crops

25. Coffee planting has increased, due to favourable prices. The export value of coffee products was \$1,096,299 as compared with \$901,598 in 1950.

26. Bananas showed a substantial increase, as indicated by the export value of \$225,902 against \$163,398 in 1950.

27. Raw rubber exports were valued at \$190,918 for 191,813 lb. These figures represent very marked increases on those for 1950 which were, respectively, \$16,535 and 20,124 lb.

WORK OF THE DEPARTMENT OF AGRICULTURE

28. There were fluctuations in the staff available during the year, the Extension Services being most affected, while several vacancies in the senior professional ranks also occurred. A training course for recruits to the subordinate staff was held. Several officers were away attending courses at Universities.

29. This section of the report summarises the activities and achievements of the Department of Agriculture. Fuller details, in unpublished reports of individual officers, are available and enquiries regarding any particular aspect of the work will be welcomed.

EXTENSION

30. The Department's Extension Division offer the following services:—

- (a) General advice to the public on agriculture;
- (b) Inspection visits to school gardens for advice and judging in connection with the Annual Competition;
- (c) Supervision of over 10,000 acres of food gardens;
- (d) Inspection of Crown Lands and interviews with applicants requesting leases for agricultural purposes;
- (e) Assistance and support to agricultural organizations, agricultural exhibitions and livestock shows;
- (f) Supervision for the district breeding units;
- (g) Supervision and management of district demonstration stations;
- (h) Parasol ant nests destruction on Crown Lands;
- (i) Plant Protection Service.

31. In addition, it collects data for Crop Surveys and any information from the districts required by the Agricultural Department.

32. District demonstration stations are maintained at Sangre Grande, Rio Claro and Penal, and at Louis d'Or in Tobago. The objects of these stations are:—

- (a) to ascertain a suitable system of mixed farming for application to peasant agriculture;
- (b) to demonstrate methods of crop production and livestock management which the peasant can copy;
- (c) to be a centre for the distribution of seed, planting material and stock;
- (d) to be the local headquarters of the Agricultural Department.

33. Disposal of stock for breeding purposes and for slaughter is shown in Table VIII.

TABLE VIII—DISPOSAL OF STOCK FROM DISTRICT STATIONS, 1951

					For Breeding	For Slaughter	Total
<i>(a) Pigs</i>							
El Reposo	...	...	...	...	12	3	15
Rio Claro	...	...	...	...	14	—	14
Penal	...	...	...	...	—	1	1
Louis d'Or	...	...	...	...	36	2	38
TOTAL	...	...	...	...	62	6	68
<i>(b) Goats</i>							
El Reposo	...	...	...	...	—	3	3
Rio Claro	...	...	...	...	3	—	3
Penal	...	...	...	...	6	—	6
Louis d'Or	...	...	...	...	3	—	3
TOTAL	...	...	...	...	12	3	15
<i>(c) Rabbits</i>							
Rio Claro	...	...	...	...	00	00	118
Louis d'Or	...	...	...	...	00	00	55
TOTAL	...	...	...	...	00	00	173
<i>(d) Cattle</i>							
Rio Claro	...	...	...	...	2	2	4
Penal	...	...	...	...	1	—	1
Louis d'Or	...	...	...	...	—	2	2
TOTAL	...	...	...	...	3	4	7

34. Revenue derived at the District Stations from the sale of livestock and crop products is represented in Table IX.

TABLE IX—REVENUE FROM DISTRICT STATIONS, 1951

				El Reposo	Rio Claro	Penal	Louis d'Or
<i>Stock</i>							
Poultry	...	...	...	\$ 71.19	\$ 38.67	\$ 14.64	\$10.56
Eggs	...	...	...	223.58	264.47	—	27.93
Animals	...	...	...	363.40	796.72	290.12	1,164.48
Milk	...	...	...	203.82	129.16	305.34	2.88
<i>Crops</i>							
Cacao	...	...	...	2,157.44	855.36	—	4,794.90
Coffee	...	...	...	42.03	5.00	—	—
Rice	...	...	...	22.00	11.23	190.39*	—
Fruit	...	...	...	—	753.55	—	—
Vegetables	...	...	...	8.90	183.85	4.49	364.89
Ground Provisions	...	...	...	144.21	710.81	—	262.84
Miscellaneous	...	...	...	35.03	66.40	132.49	908.87
TOTAL	...	...	...	\$3,271.60	\$3,815.22	\$937.47	\$7,537.35

* In addition 22,340 lb. of seed padi, valued at \$1,117.50, were handed over to the Rice Officer.

35. Statistics with respect to the Breeding Units are presented in Table X.

TABLE X—BREEDING UNIT ACTIVITIES, 1951

Total Number of Units=14 (i)

Total Number of Stockmen=17

Animals	Animal/ Months (ii)	Services	Re- services	Revenue	Expenditure	
Bulls ...	219	1,499	516	\$1,207.25	\$	
Bucks ...	180	783	212	549.99	Transport ...	395.00
Boars ...	129	271	44	204.00	Incidentals ...	461.20
Jacks ...	77	138	83	146.00	Labour ...	15,054.97
Rams ...	36	52	14	24.96	Stockfeed ...	4,930.44
TOTAL ...	641	2,743	869	\$2,132.20	\$20,841.61	

Costs (iii)

Average cost of upkeep per unit per annum = \$1,488.69

Average cost of upkeep per animal per annum = 390.12

Average cost per service (reservices excluded) = 7.60

(i) Field Units excluding Government Farms Trinidad and Tobago.

(ii) Sum of the total number of months each sire stood for service during 1951.

(iii) Excluding costs and depreciation of buildings and stock.

CROPS

Central Experiment Station

36. *General*.—Despite unfavourable weather conditions, steady progress had been made in developing the Station. Field work included the further clearing of land for the planting of sugarcane and rice as well as the maintenance of the existing cultivations. In addition, a start was made in cleaning out the large area under abandoned estate cacao and coffee. The completion of a 200 feet-span suspension footbridge over the Caroni River, linking the El Carmen Section to the main buildings, has greatly facilitated the supervision of the cultivated area.

37. *Buildings*.—The installation of electricity and temporary water supply allowed the establishment of the offices and administration centre in the Main Buildings.

38. With funds made available from a Colonial Development and Welfare grant, the construction of junior staff quarters, workshops, stores, gasoline, stock and implement sheds was started. By the end of the year, many of these buildings were nearing completion.

39. *Revenue*.—Revenue continued to rise; for the past four years it has been as follows:—

1948	...	...	\$16,319.00
1949	...	...	11,364.00
1950	...	...	26,503.50
1951	...	...	36,189.91

The year's revenue was made up as follows:—

Citrus	...	...	...	\$20,590.93
Sugarcane	...	...	...	10,171.93
Rice	...	...	...	3,158.03
Coffee	...	...	...	1,099.10
Cacao	...	...	...	749.86
Miscellaneous	...	...	...	348.50
Corn	...	...	...	50.36
Yams	...	...	...	21.20

Although still a problem, in particular with citrus, the losses from praedial larceny have been reduced.

Cacao

40. *Clonal Propagation*.—During the year the production of clones for distribution was as follows:—

La Pastora	...	...	...	233,133
Marper	...	...	...	42,544
King's Bay, Tobago	...	...	...	33,864
				309,641

In addition, propagators were operated on three privately owned estates.

41. The composition of the clonal mixtures distributed from the three main centres was as follows:—

							La Pastora	Marper	King's Bay
I.C.S.	1	...	...	...	...	...	65%	55%	65%
I.C.S.	95	...	...	...	...	...	25%	25%	25%
I.C.S.	6, 8, 9 and 45	...	...	...	...	...	10%	—	10% (mainly 9 & 45)
S.C.A.	6 and Witchbroom resistant clones	...	...	...	...	...	—	20%	—
							100	100	100

42. In view of the large number of selections which were originally made and bearing in mind that the characteristic flavour of Trinidad cacao may be due to a mixture of types, it is felt that perhaps too much reliance is being placed on a limited number of clones. Accordingly, nurseries of I.C.S. 6, 39, 60, 89, 98, I.M.C. 67 and C.C. 7 are being bulked for possible distribution.

43. *Propagation Efficiency*.—A survey made during the year showed that the loss of plant material between placing of cuttings in the rooting bins and distribution amounted to approximately 55 per cent. and 45 per cent. at La Pastora and Marper, respectively; the greatest loss occurring in the rooting bins and in the open sheds after hardening. With a view to reducing these abnormally high losses and thereby increasing the number of plants for distribution (a 10 per cent. reduction in losses at Marper alone would result in an additional 4,500 plants being available) the following steps have been taken:—

- (a) A more rigid selection of cuttings;
- (b) Elimination of sawdust from the potting mixture;
- (c) An increased period in the hardening sheds;
- (d) Spraying with Bordeaux Mixture or Iron Sulphate in the open sheds.

44. The output of the three estate propagators has been satisfactory but at two some difficulty was encountered, due to a high lime content in the water. On one estate, where the water supply is inadequate, the open type rooting bins have been proved unsatisfactory and they are being converted to the closed type.

45. *La Pastora Nurseries*.—The present area available for nurseries is proving insufficient to provide the number of cuttings to work the propagator bins to capacity. Negotiations are in progress to acquire approximately 20 acres of land adjacent to the Station.

46. *Cacao Rehabilitation*.—The continued high market price has served to accelerate the rehabilitation of cacao under a scheme of subsidisation operated by the Cocoa Board. Applications registered amount to 1,560, of which 1,450 have been approved for participation in the scheme. Of this number 565 applications were received during the year under review and 544 have been approved. Approved applications fall within the following categories:—

Estates under 25 acres	—	899
Estates of 25–50 acres	—	178
Estates over 50 acres	—	373

47. The Cocoa Board finances a series of experiments on the main soil types on which the crop is grown in Trinidad and Tobago. These experiments include:—

- (a) Clonal trials;
- (b) Fertilizer trials.

48. Experimental spraying of cacao is also financed by the Board and covers the following fields:—

- (a) Spraying for control of pests and diseases;
- (b) Spraying of trace elements and fertilizers in nutritional studies;
- (c) Spraying for weed and epiphyte control;
- (d) Investigational studies of suitable types of equipment for use on cacao estates.

49. *Diseases*.—Routine control of Witchbroom disease by a cutting out of infected tissues was continued and, in Tobago, where the disease is confined to the south-west of a line from Anse Fourmi to Delaford, an intensified campaign was carried out.

50. The Cacao Virus survey parties continued exploratory inspection eastward in the Northern Range of Trinidad, and scattered cases of virus were found in both the Guanapo and Aripo valleys. In addition to further cases of virus being found in the original centre of infection near Sangre Grande, the disease was also encountered in neighbouring areas. It seems unlikely therefore that the virus can now be confined to the Northern Range and its ultimate further spread in the Sangre Grande area seems inevitable. The field at Tompire River referred to in last year's report was revisited from time to time and 14 cases of virus cut out there. It is still under inspection. No recurrences of disease were found in other suspected areas where cacao from infected parents had been planted before the disease was recognised, except one case found in the Montserrat area, which is being watched.

51. Pink disease (*Corticium salmonicolor*) was reported on an estate in the Talparo area and on another near Moruga; abnormal rains being responsible.

52. *Calostilbe striospora* was observed at the Rio Claro Station on a few young clonal trees affected by poor drainage and dying as a consequence.

53. *Shade Trees*.—The Witchbroom disease of Anauca Immortelle (*Erythrina micropteryx*) remained under investigation but to the present the causal organism has not been identified. The disease is mainly confined to the neighbourhood of Pepper Village, Montserrat. Similar disease symptoms have been noted on old poorly growing Dadap (*E. berteriana*) trees on the farm of the Imperial College of Tropical Agriculture.

Sugarcane

54. In spite of very unfavourable weather the progress made with the development of the sugarcane area at the Central Experiment Station was satisfactory and a further seventeen acres were cleared and planted, bringing the total area under cane to a little over 57 acres.

55. Just over 27 acres of cane were reaped during the crop; the average yield was 44.37 tons cane per acre.

56. Planting during the year consisted of multiplication plots of seedlings of the B.49', B.48', B.46', and B.45' series as well as the establishment of two variety-sorting trials (B.47', B.46', B.45' series) and one fertiliser trial.

57. Over 90,000 cuttings of the B.44', B.45' and B.46' series were distributed to the various estates. Planting material of the Mauritius varieties, M.112/34, M.213/40 and M.423/41 was despatched to the United States Department of Agriculture.

58. Thirteen variety trials were reaped during the year. Of the newer varieties, B.41227 gave good yields both as plant canes and as ratoons, but its juice quality was no better than B.3337 and inferior to B.34104, B.37161 and B.37172.

59. The varietal position during the year was as follows:—

<i>Variety</i>				<i>% Total Acres Reaped</i>	<i>% Total Acres Planted</i>
B.3337 ...	...	...	...	36.9	31.1
B.34104	...	...	...	27.2	15.0
B.37161	...	...	...	18.8	20.6
B.37172	...	...	...	11.3	28.0
B.4098 ...	...	...	...	1.5	—
B.H. 10 (12)	...	...	...	1.4	—

60. The survey of the weed flora of sugarcane fields, which was started in 1950, was continued and the main findings have been published.

61. Pre-emergence weed control with 2-4-D formulations is now standard practice on two of the largest sugar estates in Trinidad. The 2-4-D is applied as an aqueous solution (approximately 2½ lb. 2-4-D in 20 gallons of water per acre) by knapsack sprayers before the weeds have emerged. Each application is effective for a period of six to eight weeks.

62. The symptoms of Chloritic Streak disease were found in canes at the Central Experiment Station and an experiment was laid out to compare cane from untreated 'seed' with that from hot water treated 'seed' (52°C. for 20 minutes), both from plants showing the symptoms. These symptoms are at times readily observable on the foliage, but the locally grown varieties do not appear to be adversely affected.

63. Typical leaf symptoms of Red Stripe (*Xanthomonas rubrilineans*) were observed on a number of varieties and experiments to verify the pathogen by inoculation are in progress at the Imperial College of Tropical Agriculture. It is now known that this disease had been present for a long time in Barbados, whence no doubt it spread to the other islands in new seedlings. The modern varieties, however, all appear to be resistant, and beyond producing rather inconspicuous leaf symptoms the disease seems to be harmless.

64. A mild form of mosaic is to be found on B.H. 10 (12) and one or two other old cane varieties grown by canefarmers in the south-west Montserrat area. The symptoms tend to disappear as the cane matures, and the absence of the disease outside one or two small areas, where infected seed continues to be used, suggests that if a vector be present in Trinidad, it does not feed on cane in the relevant areas, or else that the modern canes grown by the estates are strongly resistant to this strain of the disease, which appears to be milder than that of Jamaica, though similar in its leaf pattern on B.H.10 (12).

65. *General*.—The general picture in regard to grapefruit and oranges is one of increasing acreages, increasing yields per acre (subject to weather conditions), and increasing proportion of orange to grapefruit acreage.

66. Production of limes is diminishing as seedlings decline from epidemic root disease. Replanting with budded limes is in evidence, but will be severely limited for some time to come by an insufficient supply of plants. The Dominica Wild Grapefruit appears to be pre-eminently the most suitable rootstock for budded limes; but it has not been possible to obtain adequate supplies of seed from Dominica and the demand for budded limes greatly exceeds the available supply from the Government nurseries in Trinidad and Tobago. It is expected that the production of limes will continue slowly to diminish for the next four or five years; but should then increase gradually as budded plantings come into bearing. In consequence of the short crop, prices for limes have been very attractive.

67. *Epidemic Dying of Limes*.—Pot Experiments—In a series of pot tests with seedling limes in soils from affected areas at Toco and Erin, it was found that there was no increased growth in soils which had never carried limes, as compared with similar soils from diseased lime fields, but that there was some indication of increased growth as a result of fumigation of the "epidemic" or diseased soils. It was also found that varying water status comparable with the alteration of wet and dry seasons, adversely affected growth. In the case of the less fertile Toco soil, marked response to fertilizer was obtained; but not on the richer Erin soil. In the "epidemic" Erin soils, an ascending internal wood-necrosis, starting from the root-tip, was observed in a high proportion of the plants; but this never occurred in the plants in "virgin" soil or in potting medium. This points to the possibility of a soil pathogen damaging the vascular system at a very early stage. The experiment is to be extended by raising a large number of seedlings in Erin "epidemic" soil for observation, and the possible isolation and identification of a pathogen. It is interesting to note that the lime field on Erin "epidemic" soil died out completely during the period of the pot experiment reported above.

68. *Nutritional Studies*.—In view of the various theories that have been advanced on major or minor element deficiencies, a nutritional study was commenced in which results of soil injections, leaf injections, foliar analyses and soil analyses will be correlated. As yet, there are no indications of a nutritional deficiency being the cause of the disease. The only deficiency generally show up by leaf injection is nitrogen deficiency: but this is common to both healthy and diseased trees, moreover N shortage is characteristic of most crops on Trinidad soils.

69. *Inoculation Experiment*.—A number of root and trunk inoculations were made with a *Fusarium* sp. and a Basidiomycete fungus isolated by the Colonial Microbiological Research Institute from diseased trees from Toco: the results were negative in all cases.

70. *Field Experiments*.—Graft—transmissibility experiments were established at Piarco (Central Experiment Station), El Carmen (Central Experiment Station), Erin Estate and Alandale Estate.

71. It is observed that lime seedlings remain healthy in the limestone or coral-derived soils of Jamaica and leeward Tobago while failing in the more acid soils of Trinidad, St. Lucia, Montserrat and Dominica; Professor F. Hardy has reported that the soils of Montserrat bearing healthy limes have a higher calcium status as compared with those bearing diseased limes; further, in pot experiments carried out during the year, there were indications of better growth when the p.H. of "epidemic" soils was raised by lime. Because of this, work has been initiated to test the effect of limestone additions, a little in excess of the lime requirement, to soils in Trinidad. Soils now carrying diseased trees have been limed, and the necessary controls established, at Galera and Alandale Estates, Toco.

72. *Withertip of Limes*.—In a field at El Carmen severely infected with scale and withertip, applications at three-weekly intervals of a spray consisting of 2 lb. Perenox in 100 gallons water + 1 per cent. Albolineum, have been made throughout the year. There is, as yet, no obvious improvement over the controls.

73. One of the trees in the La Soledad plot has shown marked resistance, but not immunity, to Withertip. It is now being propagated as a clone and when sufficient plants are available, they will be set out in the field to eventually yield a bulk sample of lime oil for examination as to suitability to the trade. This precaution is essential, since the tree in question is not completely typical in character, and the possibility exists of its being a natural hybrid, and hence likely to yield a lime oil not exactly similar to pure West Indian.

74. *Citrus Rootstock and Management Trial*.—This trial (Annual Report 1950) was established during the year and management treatments were commenced prior to planting.

75. *Grapefruit—N.P.K. Trial at La Reunion, C.E.S.*—(Annual Report 1950)—The trees have been yield-recorded since 1947 and the first post-treatment yields were available during the 1950-51 crop. Results are being analysed.

76. *Grapefruit—Nitrogen, Magnesium, Zinc, Manganese—La Reunion, C.E.S.*—This trial was commenced in 1947 on full bearing Marsh Grapefruit on Sour Orange stocks, growing in Cunupia Silty Clay. The field was put down to permanent Tropical Kudzu (*Pueraria phaseoloides*) at the end of 1950; it is noted that the Kudzu stand has improved the appearance of the trees and materially reduced weeding costs. The fertilizer treatments per tree applied twice annually in May and October and imposed on an existing commercial plot are as follows:—

N. = 3 lb. Sulphate of Ammonia

Mg. = 2 lb. Magnesium Sulphate

Zn. = Spray of 1 lb. Zinc Sulphate and $\frac{1}{2}$ lb. Lime in 20 gallons of water

Mn. = Spray of $\frac{1}{2}$ lb. Manganese Sulphate and $\frac{1}{4}$ lb. Lime in 20 gallons of water (1 oz. Agral wetter and spreader to each 20 gallons).

77. Although the trial is not satisfactory due to faulty experimental design and praedial larceny, it has served as an excellent demonstration of the effects of nitrogen and zinc on citrus in a clay soil. Nitrogen alone, has led to a total increase in yield of about 300 per cent.; the addition of zinc (in conjunction with N) resulted in further increase of about 30 per cent. The use of these fertilizers would also appear to increase the proportion of Selects to Culls. Like most citrus in Trinidad, the Controls exhibit gross deficiency patterns of nitrogen and zinc, hence the results are not unexpected. There is also some magnesium deficiency pattern, but the application of magnesium as a soil amendment did not appear to have any appreciable effect on yield. There are no signs of manganese deficiency. The soil in question is not typical of citrus growing soils in Trinidad, and the indications are that routine nitrogen and zinc applications would be commercially profitable, especially where the easily recognised zinc deficiency leaf pattern is present.

78. *Cover Crop Trial.*—In September, 1948, single small plots were laid down of the perennial legumes (a) *Stylosanthes guayanensis*, (b) *Indigofera endecaphylla*, (c) *Pueraria phaseoloides* (Kudzu) as well as a plot, (d) of Toco or Tabaquite Grass, *Ischaemum aristatum*. By the following year a striking visual contrast had developed between the appearance of the trees with the leguminous covers and those with the grass cover; the former having dense green foliage compared with sparse and yellowed foliage, symptomatic of nitrogen deficiency, in the latter. It was therefore decided to establish an additional plot of each cover, and to include Controls of natural weed cover. This was done in June, 1950. Although the area is insufficient for adequate replication, the trees have been yield-recorded, so that some indications of yields have been obtained in addition to visual evidence. All trees received a standard application of 6 lb. sulphate of ammonia + zinc spray annually. *Stylosanthes* and Kudzu have given the best cover, while the *Indigofera* stand has always been sparse. Were it not for the nitrogen applications the difference between the trees under leguminous cover and those under grass cover would be even more marked. Mean yields of fruit as a percentage of Controls (natural weed cover) are given below:—

TABLE XI—MEAN GRAPEFRUIT YIELDS % CONTROLS—LA REUNION COVER CROP TRIAL

Covers planted 1948	1947-48	1948-1949			1949-1950			1950-1951		
	Selects	Se- lects	Total	Culls % Total	Se- lects	Total	Culls % Total	Se- lects	Total	Culls % Total
<i>Stylosanthes</i> ...	138	174	187	24	115	112	7	147	128	22
Kudzu ...	160	119	120	19	130	124	5	141	113	15
<i>Indigofera</i> ...	148	103	106	20	61	58	4	121	93	11
Toco Grass ...	155	98	99	19	38	37	7	35	38	39
Control ...	100	100	100	18	100	100	9	100	100	32
Covers planted 1950										
<i>Stylosanthes</i> ...	119	144	152	23	103	102	8	193	165	20
Kudzu ...	129	241	N.R.	N.R.	157	149	3	163	139	20
<i>Indigofera</i> ...	86	94	N.R.	N.R.	110	109	8	145	130	24
Toco Grass ...	115	59	N.R.	N.R.	180	170	3	88	72	18

79. In the above table the thick vertical line denotes the point at which the treatments were established. Yields prior to this point are yields while still under natural weed cover, and the differences from the Controls are a measure of the natural variation. The depressing effect of the Toco Grass, competing for nitrogen, is clearly denoted. The Indigofera has given a very poor cover, while the Stylosanthes, planted from slips, was more quickly established than the Kudzu, grown from seed; these facts are also indicated by yield figures. The trial continues; but a more critical evaluation of the effects of leguminous cover will eventually be provided by the Citrus Management trial, which is commented on earlier in this Report. It may be noted here that the leguminous covers were comparatively expensive to establish; but once established were, with the exception of the less vigorous Indigofera, economical to maintain. These covers receive no attention beyond the normal round-weeding around the trees preparatory to application of fertilizer; cutlassing costs incurred on the natural weed plots are entirely eliminated.

80. *Distribution of Citrus Plants.*—The analysis of the distribution of citrus plants from St. Augustine Station during the three-year period 1946-1948 brought out some interesting facts. The total figures are given below:—

TABLE XII—DISTRIBUTION OF CITRUS PLANTS FROM ST. AUGUSTINE STATION 1946-1948

Size of Purchase				Plants		Purchasers	
				Number	%	Number	%
1- 10 plants...	...	...	...	6,293	3	2,120	65
11- 50 plants...	...	...	...	16,074	7	607	19
51-100 plants...	...	...	...	16,212	7	193	6
101-200 plants...	...	...	...	20,701	10	132	4
201-500 plants...	...	...	...	41,067	19	122	4
Over 500 plants...	...	...	...	117,371	54	84	2
TOTAL	...	...	...	217,718	100	3,258	100

81. The above figures include commercial citrus (oranges, grapefruit, and limes), but exclude non-commercial varieties, such as lemons, mandarins, pommeloos, &c. From these, it will be observed that the bulk of the citrus plant sales are to a few large purchasers; for instance, for the three-year period under consideration, sales in lots of over 100 plants accounted for 83 per cent. of the plants produced by the Station but included only 10 per cent. of the purchasers. Conversely, 90 per cent. of the purchasers of citrus plants bought in lots of 100 or less and took only 17 per cent. of the total plants sold. The conclusion is that many of the large growers are depending upon the Station for their supplies of plants, and this is a reflection of the low price of 30 cents per plant charged at the Station. It would be desirable to have more of these large purchasers producing their own

plants; in the first instance, it would ease the demand on the Station which always has a back-log of orders, and it would also result in a wider selection of rootstock scion parents throughout the local industry.

Cocounts

82. *General*.—Crops have returned to normal after several years of adequate rainfall since the 1947 drought. The 1952 crop in the Cedros area is likely to be of record proportions.

83. No extension of the coconut acreage may be anticipated, as nearly all suitable soils are already planted; in fact, there has been some tendency for inland coconuts on the heavier soils to be replaced by other crops, such as cane and citrus.

84. The trend towards mechanisation on the larger estates continues, and rotary brush-cutters are now coming into use. These machines are likely to be increasingly used, since they avoid the root injury caused by tillage implements such as discs and rotary hoes. The practice of cover-cropping is being extended slightly in the Cedros district and on one Toco estate, Tropical Kudzu being the type of cover most favoured.

85. *Diseases*.—Bronze Leaf Wilt and Red Ring (*Aphelenchus cocophilous*) are chronic diseases of coconuts in the neighbourhood of the North-East coast and Bronze Leaf Wilt was observed causing heavy losses around La Lune on the South coast and to a lesser extent between there and Moruga. On Trinidad soils especially favouring Bronze Leaf Wilt, where the disease took a heavy toll in past years, other crops have by now generally been substituted.

86. Red Ring does not, as a rule, cause serious loss where supplying of coconuts is carried out sporadically under mature palms, but, at the Cocal, areas between the swamp and the shore replanted *in toto* some three or four years ago, have suffered very severe losses from the disease, which threatens to prevent re-establishment of coconuts in the fields concerned.

87. *Pesis*.—The weevils *Ryncophorus palmarum* and *Rhina barbirostris* were particularly destructive in the Eastern Counties, probably as a result of the prolonged wet weather that occurred during the year. The Rhinoceros beetle, *Oryctes rhinoceros* was less in evidence, but caused some damage to young trees in the Cedros-Icacos district.

88. *Squirrels*.—Owners of estates in the Cedros area reported the loss in 1950 of an estimated six million nuts from damage by Red Squirrels (*Sciurus aestuans*) which had become exceedingly numerous. In order to investigate means of control other than by the customary shooting, tests were initiated with the anticoagulant rodenticide "Warfarin" (3-(α -acetonylbenzyl)-4-hydroxycoumarin) using caged squirrels. These tests showed that although the dosage recommended for rats was innocuous to the squirrels, at double the dosage (2 parts of the 0.5 per cent. product to 19 parts chipped coconut) the squirrels were affected within a week. A field trial on a small scale also gave promising results, the take of poison baits being 100 per cent., and further more extensive field trials are planned for 1952.

Oil Palms—(Eleais Guineensis)

89. The plantings made in 1948, at El Carmen from seed from the Botanical Gardens, have continued to make good growth and some trees have started to fruit. Further seed supplies of two varieties were obtained from Nigeria and have been successfully germinated.

Rice

90. *Swamp Rice*.—Seed Production—The establishment of pure lines of seed padi occupied a prominent position in the year's programme. Most of the bulk supplies of seed padi are at present in a state of considerable impurity and the varieties will require several years of ear to row planting before they become really pure. However in order to fill the gap until this has been achieved, stocks are being produced which have not been through all stages of purification and approximately half a ton of each of the following varieties are now available:—D.52/37, D.110, No. 79, and Sugandi. This seed will form the basis for multiplication in 1952 and 1953, until pedigree stocks become available in 1954; from then onwards the quality and quantity should gradually improve, reaching a steady position in 1957-1958.

91. *Fertilizer Trials*.—In one trial carried out at Freeman Road in which the effects of deep or shallow applications of nitrogen phosphate and potash in the presence and absence of organic matter (compost), were under test, the following conclusions were reached:—

- (1) Significant responses over the control were obtained for fertilizer treatments, nitrogen dominating;
- (2) A significant response to deep application of fertilizer was obtained only in the case of sulphate of ammonia, alone;
- (3) Compost led to a significant increase;
- (4) No significant interaction existed between the application of compost and the deep application of fertilizer;
- (5) It was doubtful whether any of the increases in yield obtained were economic.

92. In a second trial, there was no response to soaking the seedlings for 12 hours in various N-P-K nutrient solution, after removal from the nursery and prior to transplanting; soaking for 24 hours resulted in a significant depression to yield.

93. In a third trial, carried out on a small scale, the early application of superphosphate in pellet form resulted in a 24 per cent. gain in yield over the control.

94. *Variety Trials*.—Yields obtained in both the trials which were carried out tended to be low as the result of *Piricularia* attack in the nursery and subsequent flooding of the plots immediately after planting.

95. The mean yields obtained from the two trials were as follows:—

TABLE XIII—RICE VARIETY TRIAL NO. 1—FREEMAN ROAD

Variety	Origin	POUNDS PADI PRE ACRE		
		1949	1950	1951
D. 52/37 ...	British Guiana ...	3,350	3,451	2,581
D. 110 ...	British Guiana ...	2,890	2,918	2,125
S.W.V. 10 ...		2,880	2,526	—
No. 79 ...	British Guiana ...	2,820	2,869	2,179
Joya (unselected) ...	Trinidad ...	2,470	2,355	2,348
Red American ...	Trinidad ...	—	3,126	2,794
Sugbandi ...	Sierra Leone ...	—	2,879	2,659
Bolo ...	Sierra Leone ...	—	2,869	2,835
Torna ...	Sierra Leone ...	—	2,923	2,366
Joya 47/48 ...	Trinidad ...	—	2,646	2,534
Sorro ...	Trinidad ...	—	2,407	2,422
Padi Tjina ...	Surinam ...	—	—	2,202
Bajabouj ...	Trinidad ...	—	—	1,654

96. The above results show most strongly the wide fluctuation in yields and relative order of merit obtained over these crops; this lack of consistency is doubtless due to lack of control of such factors as the amount and content of irrigation water.

TABLE XIV—RICE VARIETY TRIAL NO. 2—FREEMAN ROAD

Variety	Origin	Pounds Padi per acre
Pokkali ...	Ceylon ...	2,749
Kavunginpoothala ...	Madras ...	2,347
Co. 7/75 ...	Madras ...	2,309
Khetek ...		2,217
A.S.D. 5 ...	Coimbatore ...	2,149
Co. 25 ...	Coimbatore ...	1,856
Co. 23 ...	Coimbatore ...	1,498
Baisheka ...	Sierra Leone ...	1,470
A.S.D. 6 ...	Coimbatore ...	1,448
Vallai Illankalyan ...	Ceylon ...	1,121

97. It is considered that although some of these varieties may be of use in breeding, they have little to offer that is superior to those varieties already established in Trinidad.

98. *Hill Rice*.—Plantings of hill rice in the lagoon area of El Carmen gave reasonable returns of about 1,000 lb. per acre, but yields were negligible from plantings made on raised cambered beds. It would appear that this crop requires wet or waterlogged soils without actual standing surface water which has been shown to be detrimental.

99. *Rice Production*.—A Standing Rice Committee was appointed by the Governor in Executive Council in January, 1951, and a Rice Production Officer was appointed to the Department of Agriculture to promote the extension of rice growing in Trinidad and to deal with the field problems.

100. Preliminary work was concentrated mainly upon obtaining engineering survey data concerning potential rice growing areas, and the Works and Hydraulics Department studied the following:—

- (a) A block of 135 acres on the Central Experiment Station for the production of pure line padi and for experimentation;
- (b) Fishing Pond rice lands for the expansion of commercial plantings;
- (c) Plum Mitan rice lands for the expansion of commercial plantings.

101. A survey of the rice industry was initiated to ascertain:—

- (a) The number, location and particulars of rice mills in Trinidad;
- (b) The location of the main hill rice areas;
- (c) The location of swamp rice areas over 2 acres in extent;
- (d) The economics of rice farming within the two main zones, *i.e.*, Caroni Irrigation area and Oropouche Lagoon.

102. Orders have been placed for sluice gates, excavators, and other equipment to the value of over \$100,000.00.

Maize

103. A programme of selection to improve yields and quality was started during the year.

Other Food Crops

104. Collections were made during the year of a wide range of local Pigeon Pea and Cassava “varieties” with a view to selection.

Cover Crops

105. *Canavalia* showed a certain amount of promise as a cover crop at the Central Experiment Station but a heavy seed rate is required which is a disadvantage with such a large seeded crop. Sun Hemp has given excellent results at St. Augustine Station but on the heavier soil at the Central Experiment Station the growth has been disappointing. Other crops under trial are:—*Crotalaria browneii*, *C. anagyroides* and *Tephrosia*.

Fibres

106. *Kenaf*.—Plots of Kenaf (*Hibiscus cannabinus*) were under observation at St. Augustine Station and the Central Experiment Station. Unless considerable long range breeding and selection are undertaken, it is considered unlikely that this crop will succeed under the relatively uniform conditions of day length in Trinidad.

107. *Cotton*.—Plots of Marie Galante and an annual cotton, Ishana, from Nigeria, were grown at the Departmental Stations. Growth was reasonable but yields disappointing.

108. *Sisal*.—Five thousand bulbils of *Agave furcroides* were imported from Jamaica and established in a nursery.

Miscellaneous

109. Introductions during the year included planting material of:—*Tithonia diversifolia*, *Pogostenan cablin*, *Patchouli*, *Cymbopoga martinii*, *Palena rosa*,

St. Augustine Station

110. *Revenue*.—Once again a new high was set in 1951. Revenue for the past seven years has been as follows:—

1945	...	...	\$24,031.90
1946	...	...	45,923.00
1947	...	...	44,164.95
1948	...	...	46,830.16
1949	...	...	55,963.34
1950	...	...	62,834.76
1951	...	...	65,000.00 (approximately).

111. *Citrus Plants*.—The record number of 97,689 budded citrus plants was distributed during the year. Of this total, 1,346 were on “free issue” to Government Departments, &c. Once again the greatest demand was for orange plants, of which 57,470 were distributed. Orders for 1952 amount to over 200,000 plants.

112. *Avocados*.—A total of 7,882 budded avocado plants was distributed; 32 of these being on “free issue”. Orders for delivery in 1952 total about 12,000 plants.

113. *Mangoes*.—Some 7,599 grafted mango plants were distributed during the year as compared with 3,650 in 1950. Orders for 1952 amount to over 9,000 plants and it is hoped that it will be possible to meet most of these.

114. *Vegetable Seedlings and Ornamental Plants*.—Production of vegetable seedlings showed an increase over the previous year; sales for 1951 were 8,374 boxes as against 5,403 in 1950, and 60 boxes were distributed on “free issue”.

115. The demand for ornamental plants in boxes was about the same as in the previous year; 4,386 boxes were sold and 77 distributed on “free issue”. Sales of flowering trees, shrubs and hedge plants in bamboo pots amounted to 39,882 plants, while “free issue” totalled 4,585.

116. *Orchard Crops*.—A total of 7,839 crates of seeded and Marsh grapefruit and 66 crates of oranges were delivered to the Co-operative Citrus Growers' Association. In addition, some 86,000 grapefruit and 143,000 oranges were sold locally.

117. *Field Crops*.—Some 16,444 lb. of dry shelled corn were distributed; the majority being sold to the Marketing Division. In addition, 24,536 cobs of green corn were sold as food from inter-plantings in the citrus nurseries.

118. About 37,673 lb. of yams were harvested; the majority was sold to the Marketing Division as seed.

119. As in the previous year, weather conditions were unfavourable to the pigeon pea and tomato yields. Some 693 lb. of dry pigeon pea seed and 589 lb. of green peas for food were sold. Average yield from the tomato plantings amounted to only a little over 1,500 lb. per acre, as compared with 10,000-12,000 lb. per acre in the favourable season of 1949. As usual, small amounts of cowpea, wooly pyre and other cover crops were grown to maintain seed supplies.

120. Sun Hemp continued as the major cover-crop in use on the Station, especially in the drier periods of the year, while sunflower appear better adapted to the wet season.

SOIL SURVEY

121. Field work of the Soil Survey Division included selection of the main sites for experiments with clonal cacao. The La Romain area, near San Fernando, was also completed and work was started in the Moruga area.

122. In the laboratory 2,785 determinations were made and the analyses for the "Soils of Central Trinidad" report were completed. This report was submitted to the Government Printer and the proofs have been received. Arrangements were made for printing of the soil map in England by the Directorate of Colonial Surveys.

LIVESTOCK

Animal Health

123. *Visit of Adviser on Animal Health.*—Mr. R. J. Simmons, C.B.E., M.R.C.V.S., Adviser on Animal Health to the Secretary of State for the Colonies, visited the Colony during the periods of 7th-9th January, 22nd-26th January and 2nd-7th March. During this time general discussions took place on animal health.

124. *Visit of Mr. S. L. Hignett, B.Sc., M.R.C.V.S.*—This gentleman, who is the resident Veterinary Surgeon at the Wellcome Veterinary Research Station, Frant, Sussex, England, visited the Colony at the request of the Comptroller, Colonial Development and Welfare in the British West Indies. Mr. Hignett advised on animal breeding problems with special reference to infertility in general.

125. *Incidence of Disease in the Caribbean.*—The Animal Diseases Reporting Service of the Caribbean Commission continued to operate during the year. This service takes the form of a monthly statement on the incidence of listed diseases throughout the Caribbean area as submitted by veterinarians in territories within the terms of reference of the Commission. The summary of such diseases in the Colony for the year is as follows:—

<i>Disease</i>					
Anaplasmosis	...	...	...	...	5 cases
Brucellosis (No. of cattle tested 222)	...	...	...	...	No reactors
Distemper (Canine)	...	...	...	...	78 cases

Disease

Fowl Cholera	...	...	...	...	54 outbreaks
Fowl Typhoid	...	...	...	...	2 „
Laryngotracheitis	...	...	...	...	1 outbreak
Johne's Disease	...	...	...	...	3 cases
Leptospirosis	...	...	...	...	15 „
Lymphangitis-ulcerative	...	...	...	...	10 „
Mange—Equine	...	...	...	...	16 „
Rabies Paralytic (Bat transmitted)	...	...	...	...	27 „
Strangles	...	...	...	...	46 „
Trichomoniasis	...	...	...	...	4 „
Tuberculosis :					
No. of cattle tested 3,887	...	...	...	...	1.4% reactors
No. of water buffalo tested 1,167	...	...	...	...	28.0% „
No. of dairy goats tested 112	...	...	...	...	0.9% „
Variola Vaccinia	...	...	...	...	6 cases

126. *Foot and Mouth Disease Conference*.—A Regional Consultative Foot and Mouth Disease Conference was held in the City of Panama from 21st to 24th August. The Deputy Director (Animal Husbandry) represented the Colony and headed the delegation from the United Kingdom. The main recommendations of this Conference were the support of the Foot and Mouth Disease Centre at Rio de Janeiro, Brazil; the adoption of stringent regulations to prevent the entry of this disease into territories where it does not exist, and the creation of a fund to be used for implementing emergency measures against any outbreak of this disease.

127. *British Caribbean Advisory Council on Agriculture, Animal Health and Husbandry, Forestry and Fisheries*.—This Council held its inaugural meeting at Barbados from 17th to 20th December. The Colony was represented by the Deputy Director (Crop Husbandry) and the Deputy Director (Animal Husbandry). The Council endorsed the recommendations of the first British Caribbean Veterinary Conference (1947) and the Livestock Conference, Caribbean Commission (1950) that the Jamaica Diseases of Animals Act should be the model on which other territories should base legislation modified to meet their needs. The Council considers that the introduction of such uniform animal disease legislation would permit a reciprocal exchange of livestock within the area.

128. *Veterinary Diagnostic Laboratory*.—As in the previous year, work undertaken fell under the following main heads:—Milk testing and examination; Pathological investigation; Serological diagnosis; Urinalysis, including equine pregnancy tests.

129. The routine examination of milk produced and purchased by the Trinidad Stock Farm was maintained throughout the year. This included the Resazurin grading, butter-fat determination and bacteriological examination.

130. Pathological investigational work included surveys to determine the incidence of Brucellosis and tick-borne diseases on the Trinidad Stock Farm. Other studies carried out were in connection with Johne's Disease, tuberculosis, trichomoniasis and faecal examination of Farm stock, chiefly calves, sheep and goats.

131. The following is a summary of the specimens handled at the Laboratory:—

Milk samples	...	...	1,091
Faecal examinations	...	...	507
Poultry post mortems	...	...	40
Serological tests	...	...	2,427
Urinalysis	...	...	8
Blood smears	...	...	11
Miscellaneous	...	...	4

Proclaimed Diseases

132. *Foot and Mouth Disease*.—Reference has already been made (paragraph 125) to the Conference on this disease in Panama. Legislation was enacted to prohibit the importation from Columbia of all cloven-footed animals, their products, grain, litter, &c., into the Colony, due to an outbreak of this disease.

133. Regulations were made to permit the importation of hides and skins from countries where this disease exists subject to an import permit and to specified sterilization on arrival in the Colony.

134. *Rabies (Paralytic—Bat-transmitted)*.—A total number of 27 cases of this disease, the diagnosis of which was confirmed by the Government Pathologist, was reported during the year. The first 20 cases occurred in February in the southern part of Trinidad in the Salazar Trace, Point Fortin areas. Quick control of the outbreak was obtained by protective vaccination assisted by the destruction of vampire bats in the areas as carried out by the Health Department.

135. There was a further recurrence of this disease towards the end of September in the Four Roads-Talparo area which gradually spread and reports were received from the Cumuta, Hendrage Trace, Guatalpajaro, Caratal, Mundo Nuevo and Caparo Valley Road districts. Of these seven reports, six were confirmed as being this disease. A total number of 534 protective vaccinations were carried out during the year.

136. *Tuberculosis*.—Tuberculin tests were carried out on the following Government-owned livestock:—

<i>Class of Animal</i>	<i>No. Tested</i>	<i>Reactors</i>
Cattle	215	Nil
Water Buffaloes	5	Nil
Swine	26	Nil
Goats	35	Nil

The testing of privately-owned livestock, principally dairy cows, chiefly in the rural areas around Port-of-Spain continued. A total number of 3,674 was tested of which 58—1.58 per cent. gave a positive reaction.

137. The incidence of this disease in water buffaloes continues to be high. A total number of 1,167 was tested, of which 328—28 per cent.—gave a positive reaction. The sugar plantations have implemented a few of the suggestions made by the Department and by their retained veterinarians. However, they are not inclined to the slaughter policy of all reactors, which they claim would seriously interfere with the transport operations, especially at harvest. It must be pointed out, however, that as long as reactors in such numbers continue to remain in the herds, they continue to be potent foci of infection and a menace to the cattle population as a whole.

138. *Swine Fever*.—The Colony remained free of this disease during the year. A total number of 111 pigs were given protective vaccination with Crystal Violet vaccine.

Non-Proclaimed and Parasitic Diseases

139. *Brucellosis*.—The serum-agglutination test was carried out on the cattle and goats at the Stock Farms, using both an abortus and militensis antigen on the latter class. A total number of 86 cattle and 17 goats were tested with negative results. Five privately-owned cattle were also tested with negative results.

Johne's Disease

140. Six cases of this disease in cattle were recorded during the year.

141. *Mastitis*.—The incidence of this disease continued to decline during the year.

142. *Strangles*.—Forty-six cases occurred in mules imported from the United States of America.

143. *Pneumono-Enteritis in Calves*.—The new system of calf management on the Trinidad Stock Farm has given very satisfactory results and it is interesting to record that although the year was characterised by an unusually heavy rainfall the calves suffered no ill effects from exposure. One death in a baby calf was recorded due to anaemia of unknown cause.

144. *Poultry Diseases*.—There were reports of the incidence of Fowl Cholera from all sections of the Colony and severe losses were sustained by poultry-keepers. However, the incidence of the disease gradually abated towards the end of the year. One outbreak of Laryngotracheitis and two outbreaks of Fowl Typhoid were reported.

145. *Anaplasmosis and Piroplasmosis*.—Four cases of Anaplasmosis were recorded during the year, two in cattle at the Trinidad Stock Farm and two in privately-owned cattle. Blood smears from the cattle herd at the Trinidad Stock Farm were examined for the presence of these parasites; all were negative for Piroplasma and two as above, positive for Anaplasma.

146. *Diseases of Dogs*.—There were 78 cases of distemper and 15 cases of leptospirosis.

External Parasites

147. Routine fortnightly hand-spraying of cattle at the Trinidad Stock Farm with a home-mixed B.H.C.-D.D.T. preparation was continue. This product gave very satisfactory results. Sixteen cases of sarcoptic mange were recorded during the year.

Internal Parasites

148. Routine anthelmintic treatment was carried out in respect of calves and goats, based on the findings of faecal examinations. The Phenothiazine dosages employed on the Farm for many years were increased with most satisfactory results.

Animal Husbandry

149. *Livestock Shows*.—The following livestock shows were held during the year:—

- (i) The Trinidad Goat Society's Tenth Annual Show, 5th May, at Trinidad Turf Club Grand Stand, Port-of-Spain;
- (ii) Seven Cane Farmers' and Peasants' Shows in the Sugar Belt areas during the months of September-November;
- (iii) Tobago District Agricultural Society, 17th November, at Louis d'Or.

150. *Breed Improvement*.—Table XV records the services by improved sires at the Stock Farms and District Breeding Units in Trinidad and Tobago.

TABLE XV—SERVICES BY IMPROVED SIRES, 1951

Class of Sire				Trinidad	Tobago	Total
Stallions—Thoroughbred	...	...	...	13	23	36
—Light Draft	...	...	...	9	7	16
Jacks to mares	...	...	...	16	36	52
Jacks to jennies	...	...	...	15	55	70
Bulls	...	...	...	2,139	144	2,283
Boars	...	...	...	394	132	526
Bucks	...	...	...	1,015	254	1,269
Rams	...	...	...	—	67	67

151. The services of imported sires to Government-owned animals on Farms and District Stations are not included in Table XV; nor are those of a number of pure-bred Sahiwal bulls which were made available in Tobago at the following estates:—Friendship, Lowlands, New Grange, Diamond, Orange Hill, Calder Hall and Richmond.

152. In keeping with the recommendations of the Local Food Production Committee that the Department should suspend the sale of female livestock, especially cows, the customary annual sale of surplus livestock at the Trinidad Stock Farm was restricted to the following:—

25 pure-bred Large Black pigs	...	...	...	\$1,009
144 head of poultry	...	...	...	937
12 rabbits	...	...	...	38
				\$1,984

It was also possible to dispose privately of a number of livestock from both the Trinidad and Tobago Farms. These were as follows:—

Trinidad Farm

- 21 bulls and bull calves
 - 4 bucks
 - 2 does
 - 12 boars
 - 21 sows
- and a large number of poultry and eggs.

Tobago Farm

- 1 horse
- 2 bulls
- 17 cows and heifers
- 3 oxen
- 5 water buffaloes
- 4 bucks
- 2 boars
- 1 sow
- 1 gilt and 73 piglets
- 5 rams
- 2 ewes
- 1 wether.

153. *Cattle Management.*—There were no major changes in management as outlined in the 1950 Report. The system of calf husbandry, already described, continued to give satisfactory results. There were two deaths among these, one due to acute dilatation of the heart and the other to anaemia. The following table shows the number of births and deaths during the past five years:—

TABLE XVI—CALF STATISTICS, TRINIDAD STOCK FARM

Year					Births	Deaths
1947	...	...	...	...	135	24
1948	...	...	...	...	152	21
1949	...	...	...	...	112	10
1950	...	...	...	...	80	—
1951	...	...	...	...	94	2

154. In the grading policy at the Trinidad Farm, special emphasis was placed on the production of $\frac{1}{2}$ Holstein (*Bos taurus*)—Zebu (*Bos indicus*) in view of the half-breds being more adapted to local climatic conditions in general.

155. At the Tobago Farm, work was continued on the establishment of a Sahiwal herd, both pure-bred and grade.

156. *Trinidad Farm—Milk Production.*—The thrice-a-day milking was continued. Milk yields were satisfactory and the cows maintained good condition. As there was no marked dry season, it was not possible to support the observation made in previous years, that milk yields are highest during the dry season. However, it was noticeable that milk production was chiefly governed by the availability of good grazing, as yields dropped significantly when grazing was not satisfactory. The total production of 55,350 gallons was obtained from 94 animals, a herd average of 589 gallons per cow as compared to 444 gallons in 1950. There were fourteen first calvers and, with one exception, the others are doing well. An outstanding performance came from a grade Holstein, Doolaria 12th, over 60 lb. in one day's production.

157. The following table gives the comparative Farm production for the years 1947–1951:—

TABLE XVII—MILK YIELD AT THE TRINIDAD STOCK FARM

Year				Average No. of Cows milked daily	Total Annual Yield lb.	Daily average yield per cow, lb.
1951	...	...	...	60	553,364	25
1950	...	...	...	69	533,349	21
1949	...	...	...	74	453,236	17
1948	...	...	...	79	391,424	13
1947	...	...	...	80	407,265	14

158. *Horsekind.*—There was no significant change in the equine breeding policy as from the previous year. The response to the use of the light draft stallion was disappointing.

159. *Pigs.*—The management of these continued as before and the growth rate of young pigs was very satisfactory. Improved measures taken to prevent the crushing of young pigs proved very satisfactory and controlled losses from this complaint. Twenty-two Berkshire gilts were imported from Canada in implementation of recommendations made by the Local Food Production Committee. These gilts were distributed to various centres.

160. *Goats.*—The experimental outdoor system of management was continued with encouraging results. The main object of this system is to promote a more hardy type of animal which should be well adapted to peasant management and environment. Improvements in this section include the construction of six new enclosures and two additional paddocks for grazing.

161. *Poultry.*—As a result of a high incidence of Pullorum disease in the unit at the Trinidad Farm, this was depopulated and hygienic measures taken to control further spread of this infection. Replacement stock of both the Rhode Island Red and White Leghorn breeds, of high performance standards, was imported from Canada as day-old chicks. These arrived in good condition and some of the pullets were in lay by the end of the year. The small unit of White Muscovy ducks continued to produce good results and the numbers are being increased.

162. *Pastures, Fences, Crops, &c.*—Continued emphasis was placed on the controlled pasture management at the Trinidad Farm and further development of available acreage. The replanting of poor and low-yielding fields was carried out in conjunction with the application of pen manure. Work also continued in the search for suitable pasture grasses as well as the establishment of Tropical Kudzu (*Pueraria phaseoloides*). Trials on another legume, *Indigofera endecaphylla* were discontinued, mainly on account of its unpalatability. All unfinished fences were completed during the year; some new areas were also fenced and general maintenance on existing fences was carried out.

MARKETING AND FISHERIES DIVISION

Marketing

163. *Market Conditions.*—Ground provisions were in fair supply throughout the year, and a fairly wide variety under this head was offered in all markets. There were no periods of glut, and prices remained remunerative. Adverse weather conditions affected the supply of sweet potatoes.

164. *Fruit.*—Fruit was in satisfactory supply throughout the year.

165. *Green Vegetables.*—Heavy rains and floods at planting time ruined green vegetable gardens, and tomatoes particularly were scarce for the greater part of the year.

166. *Corn.*—Corn was severely set back by rains and remained in poor supply for the year. Supplies from British Honduras and British Guiana were obtained by the Marketing Board to provide for stockowners' needs and for prepared feeds. The amounts purchased were 878,000 lb. valued at \$65,256.17.

167. *Pulses.*—Both green and dry pigeon peas were scarce during the season. Black-eye peas were in short supply with small quantities being offered at high prices.

168. *Ground Provisions.*—Ground provisions were in fair supply during the year. Eddoes, however, were short and fetched very good prices as compared with those in 1950.

169. *Importations.*—Importations during the year were as set out hereunder:—

	1950	1951
	Tons	Tons
Sweet potatoes	1,336	1,206
Yams	5	7
Plantains	131	104
Other Vegetables	417	5
	1,889	1,322

170. *Shipments.*—Shipments from Tobago are shown below:—

				1950	1951
				Tons	Tons
Bananas	...	...	...	46	86
Plantains	...	...	...	115	65
Ground Provisions	...	...	...	2,000	939
Corn	...	...	...	47	51
Peas	...	...	...	77	5
				2,285	1,146

The decrease in receipts from Tobago was the result of unfavourable weather conditions which affected plantings in the Island Ward.

171. *Ground Provisions Depot.*—The Ground Provisions Depot exists for:—

- (i) Purchasing ground provisions, fruit and green vegetables from producers;
- (ii) Providing supplies to Government Medical Institutions;
- (iii) Retailing to the public.

During the year purchases amounted to \$111,181.76 and sales to \$134,817.43 as compared with \$90,438.55 and \$114,898.87, respectively in 1950. Total purchases are analysed below:—

Ground provisions	...	...	\$ 28,148.07
Green Vegetables	...	...	46,191.28
Fruits	...	...	12,835.88
Sundries	...	...	15,637.46
Bananas	...	...	8,369.07
			\$111,181.76

172. *Seeds and Planting Material.*—The object in this regard has been to provide growers with a supply of suitable and reliable seeds. Supplies were obtained chiefly from Messrs. W. Atlee Burpee Co. and Messrs. Peter Henderson & Co. of the United States of America whose seeds have given good results under local conditions. Supplies have also been obtained from Messrs. Sutton & Sons of India. Sales of seeds and other planting material, especially Gros Michel banana plants, showed a marked increase. Comparative figures of sales of planting material are given below:—

			1950	1951
Imported seeds	...	...	\$17,017.60	\$18,382.23
Local plants	...	...	1,158.97	2,805.09

173. *Fertilizers and Insecticides*.—The demand for fertilizers and insecticides increased substantially, reflecting, no doubt, a greater appreciation by growers of these commodities. These two items were offered for sale at all Marketing Depots and also at Demonstration Stations. The comparative figures of sales are set out below:—

		1950	1951
Fertilizers		32,239 lb.	71,475 lb.
Insecticides		\$5.74	\$844.36

174. *Rice Husks*.—This offal was purchased for the extraction of rice bran and broken rice which are incorporated in stockfeeds. With steadily rising prices of all ingredients, mainly from dollar sources, the need for the provision of cheap protein feeds became more pressing and it was necessary to explore every possible avenue for obtaining increased supplies of bran. The amount of husks passed over the aspirator in 1951 was 770,714 lb. from which 247,324 lb. rice bran and 29,021 lb. broken rice were recovered. Purchases of husks were made in the Caroni and Penal Lagoon district only. It is proposed to cover a much wider area in 1952.

175. *Depot Extensions*.—A sub-depot was opened at the Penal public market towards the end of the year. Seeds, fertilizers, insecticides and animal feeds were offered for sale on the main market days. Good use was made by farmers of the facilities offered.

176. *Fish*.—The fishing period on the North Coast, during the year under review, was a poor one, as rough seas made it difficult for the boats to put out as often as desirable. The season opened in June with very poor catches but some improvement was shown during the later part of the year. There were no heavy gults of fish on the market, and the season closed in November. The amounts purchased from the Co-operatives totalled 123,410 lb. valued at \$28,264.52 as compared with 190,705 lb. valued at \$36,560.83 in the previous year.

177. *Molasses*.—Adequate supplies of molasses were made available at the following depots:—Arima, Scarborough, Sangre Grande and Toco, and 12,600 gallons were purchased valued at \$1,908.00.

178. *Banana Exports*.—The export of Gros Michel bananas was continued under the terms of the contract entered into with the Caribbean Fruit Company of New Orleans, Louisiana. During the year, 83,305 stems were shipped with a value of \$176,888.64 B.W.I., equivalent to \$103,625.45 U.S. currency. This represented an increase of approximately 34 per cent. on the quantity shipped in 1950 and was mainly the result of the change from fortnightly to weekly shipments.

179. The following livestock feeds were prepared and sold:—

		Quantity	Value
Dairy feed		1,141,417 lb.	\$71,789.78
Poultry feed		594,329 „	47,264.41
Scratch grain		383,143 „	31,651.91
Pig ration		132,600 „	7,685.29
and feed ingredients to the extent of		755,637 „	44,427.11

were sold to Government Institutions and livestock owners.

Fisheries

180. *Improvements.*—The Department of Works and Hydraulics notified the completion of work on the fishing centre at Bonasse Village, Cedros, and advised that completion of the centre at Icacos would be effected early in 1952.

181. *Experiments.*—Experimental work was undertaken on—

- (i) the suitability of fish offal for preparation of fish meal;
- (ii) the wet salting of mackerel and salmon;
- (iii) the brining and smoking of herrings and mackerel.

182. *Suitability of Fish Offal for Preparation of Fish Meal.*—Difficulty was encountered in obtaining a satisfactory supply of offal for continuing the experiment because very little fish is dressed before sale. The limited work which was undertaken was insufficient to warrant any definite conclusions, but it did indicate the necessity for further investigation into the possibilities.

183. *Wet Salting of Mackerel and Salmon.*—A small experiment was made on wet salting of mackerel and salmon which indicated that there were possibilities in preservation of these kinds during the period of glut to be held over for disposal during periods of scarcity. The experimental pack was held for two months, at the expiration of which it had deteriorated. This, however, was considered as being attributable to the use of second-hand packages which might not have been suitable although every effort was made to clean them thoroughly before use. It is proposed to conduct further experiments using new packages.

184. *Brining and Smoking of Herrings and Mackerel.*—Work on this project indicated that a greater measure of control was needed over atmospheric temperature and humidity as well as over moisture, temperature, volume and quality of the smoking medium. Further work will be undertaken in 1952 with better equipment than was available.

185. *Statistical Data.*—Information kindly supplied by the Municipalities revealed the following amounts of fish passing through municipal markets:—

Port-of-Spain	...	...	2,247,550 lb.
San Fernando	...	...	828,298 lb.
			3,075,848 lb.

186. *Trawl-Fishing.*—Towards the end of the year, two fishing trawlers, one British, the other American, arrived in the Colony, the former to undertake commercial trawl-fishing, and the latter to carry out a survey of the waters around the coast with a view to assessing the possibilities for trawl-fishing.

187. The British trawler was inadequately equipped for fishing in these tropical waters and had to carry out major adjustments to its gear. The Fisheries Division co-operated to the fullest extent possible in this work. The Division itself is contemplating experiments with different types of gear with the consent of owners of the vessel.

188. The American trawler commenced charting of sea bottoms. This work is expected to be completed in 12 months and the data will be made available to the Division.

LAND SETTLEMENT

189. During 1951, 111 tenants were signed on for allotments, of which 25 had not been previously tenanted while 86 had been either repossessed or surrendered. There are now 1,797 allotments on leasehold settlements, 1,472 of which are tenanted and 1,247 on freehold settlements with 1,200 tenanted.

190. Re-conditioning and repairs to Government-owned settlers' houses were carried out at La Pastora and Brooklyn Settlements.

191. Settlers generally showed great interest in the construction of their own houses and on a number of settlements a much better type of house is being constructed than in past years. This might be because building material is more easily procurable but the settler is also giving more regard to his holding as his permanent home.

192. There has been a general increase in the livestock on settlements in most classes as the following table shows. The exceptions are poultry, due to disease in epidemic proportions, rabbits and sheep, which appear to have been affected by weather conditions:—

TABLE XVIII—LIVESTOCK ON LAND SETTLEMENTS

				1950	1951
Horsekind	...	...	...	54	101
Cattle	...	...	...	474	579
Pigs	...	...	...	298	344
Goats	...	...	...	299	319
Sheep	...	...	...	29	5
Rabbits	...	...	...	14	—
Poultry	...	...	...	10,619	8,908

193. Revenue earned on land settlements from the sale of Government produce was as follows:—

Corn	...	...	...	\$ 176.70
Citrus	...	...	...	2,195.54
Cacao	...	...	...	9,495.88
Coffee	...	...	...	25.03
Nutmegs	...	...	...	21.00
Ground Provisions	...	...	...	90.94
Coconuts	...	...	...	428.87
Timber	...	...	...	516.45
Bananas	...	...	...	164.91
Miscellaneous	...	...	...	303.29
				\$13,418.61

STAFF NOTES

194. Mr. E. W. Leach, Director of Agriculture, proceeded on vacation leave to the United Kingdom on 4th July.
195. Mr. R. G. Fennah, Entomologist, left the Colony on 4th July on vacation leave. On his return on 1st November, he took up an appointment with the Imperial College of Tropical Agriculture as Entomologist.
196. Dr. A. V. Hall, Veterinary Officer, Government Stock Farm, Trinidad, proceeded to Canada on 24th August on vacation and study leave.
197. Mr. G. C. Witt, Soil Survey Officer, left the Colony for the United Kingdom on 1st March on 136 days vacation leave.
198. Senior Agricultural Assistants, Messrs. A. E. Joseph and V. I. Mulloon, proceeded on 180 days and 169 days vacation leave, respectively, to the United Kingdom.
199. Agricultural Assistant, Mr. W. A. McMillan, left the Colony for the United Kingdom early in November on 153 days vacation leave.
200. Messrs. I. E. Telfer and E. L. Iton, Agricultural Assistants were awarded two-year Colonial Development and Welfare Courses and left the Colony on 12th September and 4th July, respectively.
201. Returning from vacation leave were Mr. C. Holman B. Williams, Deputy Director of Agriculture (Crop Husbandry) and Mr. G. P. Blair, Agricultural Officer.
202. Messrs. G. Khan and R. E. Greaves, Agricultural Assistants, returned to the Colony from Canada where they had undergone a successful year's study at McDonald College and the University of British Columbia, respectively.
203. Mr. C. B. Brown, Scientific Assistant, returned to the Colony from Canada in the month of June, after having gained the Bachelor of Science degree at McGill University. Mr. Brown was promoted to the post of Soil Survey Officer with effect from 26th June.
204. Mr. F. Raphael, Officer-in-Charge, Marper Propagating Station, was promoted to the post of Agricultural Assistant with effect from 15th January.
205. Mr. C. A. S. Hynam, Superintendent of Agriculture, St. Kitts, was transferred to this Colony on promotion to the post of Agricultural Officer. Mr. Hynam assumed duty in South Trinidad on 28th December.
206. Mr. R. Moosai-Maharaj, Senior Agricultural Assistant, returned to the Colony on 5th August from a one-year Devonshire Course in the United Kingdom.
207. Dr. F. O. Gonzalez, a 1947 Nuffield scholar, returned to the Colony on 23rd August, after obtaining the B.Sc. (Veterinary Science) degree and the award of the M.R.C.V.S.

208. Mr. R. W. M. Leacock, Senior Agricultural Assistant retired from the service on 5th July on reaching the age limit.

209. Mr. D. Hosang, Field Assistant, Grade II, retired from the service on 9th October on reaching the age limit.

210. Mr. P. Hosein, Field Assistant, Grade I, and Mr. S. P. Hosein, Field Assistant, Grade II were transferred to the Co-operative Department with effect from 1st August.

PUBLICATIONS

211. The following appeared in the Supplements to the Journal of the Agricultural Society of Trinidad and Tobago in the months indicated in brackets after each item:—

Termites—Their Life History and Measures for their Control by R. G. Fennah, M.A., A.I.C.T.A. (March).

Extracting and Packing Honey for the Market by E. A. Emond (March).

The Rice Industry by E. G. Benson, B.Sc., A.I.C.T.A. (March).

Grow More Food through Mixed Farming by Dr. J. L. Shannon, D.V.M. (June).

Transportation of Animals and Carcasses by T. A. des Iles, D.V.M., Dip. Agric. (June).

The Food Value of Rice by G. C. Witt, B.Sc., A.R.C.S. (June).

The Cultivation of West Indian Limes by M. N. Lucie-Smith, M.A., B.Sc., A.I.C.T.A., Dip. Agric. (September).

The Livestock Work of the Department of Agriculture by H. V. M. Metivier, O.B.E., M.R.C.V.S., B.Sc. (September).

Calf Management by H. V. M. Metivier, O.B.E., M.R.C.V.S., B.Sc. (September).

The Best Stockmen of Trinidad's Sugar Belt by T. A. des Iles, D.V.M., Dip. Agric. (September).

Diseases of Economic Plants in Trinidad and Tobago by E. B. Martyn, B.A., A.I.C.T.A. (December).

212. The following were contributed to *Tropical Agriculture*:—Eye Estimation of Paddy Yields in British Guiana by V. O. Ferrer, M.Sc., D.I.C.T.A., F.R. Econ. S. (Vol. XXVIII, p. 63-67).

The Design and Construction of Notices for Experimental Plots by R. Barrie-Smith, B.Sc., Dip. Agric., D.T.A. (Vol. XXVIII, p. 68-69).

The Garden Hose—U-Tube Level by V. I. Mulloon (Vol. XXVIII, p. 228-230).

213. Useful and Ornamental Plants of Trinidad and Tobago, by R. O. Williams, O.B.E. and R. O. Williams, Jnr., A.I.C.T.A., D.I.C.T.A., 4th Edition, Revised is obtainable from the Department of Agriculture, Trinidad at \$2.00 B.W.I. per copy.

LEGISLATION

	Date	References	Remarks
Gazette Notice No. 21. Appointment to Cocoa Board	4th January, 1951	AGRICULTURAL Cocoa Industry Ordinance, Ch. 23, No. 22	Appointment of Hon. H. E. Robinson to Cocoa Board
Gazette Notice No. 22. Appointments to Cocoa Board	4th January, 1951	Cocoa Industry Ordinance, Ch. 23, No. 22	List of persons re-appointed to the Cocoa Board
Gazette Notice No. 65. Agricultural Credit Societies	2nd January, 1951	Agricultural Co-operative Societies Ordinance, Ch. 23, No. 3	List of Agricultural Co-operatives Societies
Gazette Notice No. 135. Interim Price of Farmers' Canes	19th January, 1951	Production of Cane Ordinance, 1946	Interim price fixed at \$6.00 a ton
Gazette Notice No. 179. Appointments to Standing Rice Committee	1st February, 1951	— — —	List of persons appointed to Standing Rice Committee
Gazette Notice No. 526. Cane Farming Arbitration Board	29th March, 1951	Production of Cane Ordinance, 1946	Appointment of additional members to the Cane Farming Arbitration Board
Gazette Notice No. 628. Sugar Industry Labour Welfare Fund Committee	19th April, 1951	Sugar Industry Special Funds Ordinance	Appointment of members to the Sugar Industry Labour Welfare Fund Committee
Gazette Notices Nos. 917-18. Appointments to Cocoa Board	7th June, 1951	Cocoa Industry Ordinance, Ch. 23, No. 22	Appointments of G. Gianetti and H. P. Hutton to Cocoa Board
Gazette Notice No. 1029. Price of Copra	28th June, 1951	Copra Products Ch. 32, No. 13	Minimum price for copra fixed at \$9.64 per 100 lb.
Gazette Notice No. 1069. Copra permits	29th June, 1951	Copra Products Ch. 32, No. 13	Cancellation of permits to buy or sell copra
Gazette Notice No. 1159. Appointment to Sugar Industry Rehabilitation Committee	12th July, 1951	Sugar Industry Special Funds Ordinance	Appointment of P. J. Knox to act on Sugar Industry Rehabilitation Committee
Gazette Notice No. 1324. Price of Copra	27th August, 1951	Copra Products Ch. 32, No. 13	Minimum price of copra fixed at \$12.50 per 100 lb.
Gazette Notice No. 1358. Sale of Copra	1st September, 1951	Copra Products Ch. 32, No. 13	Cancellation of permits to buy or sell copra
Gazette Notice No. 1450. Cocoa Pool Payment	24th September, 1951	Cocoa Industry Ordinance, Ch. 23, No. 22	Payment for crop period 1st October, 1950 to 31st March, 1951
Government Notice No. 21. Sugar Quotas Order	15th May, 1951	Sugar Quotas Ordinance, Ch. 23, No. 13	Sugar Quotas Order for 1951
Government Notice No. 173. Sugar Industry Special Funds (Amendment) Ordinance	2nd November, 1951	Sugar Industry Special Funds Ordinance, 1948	Amendment to Regulation 4 of Ordinance
Government Notice No. 81. Sugar Quotas (Amendment) Ordinance	15th May, 1951	Sugar Quotas Ordinance, Ch. 23, No. 13	Amendment to Paragraph 2 of Ordinance.

Date	Reference	Remarks
	<i>AGRICULTURAL—Continued</i>	
Government Notice No. 84. Sugar Industry Wages Regulation	...	Minimum remuneration payable to workers in the sugar industry
Government Notice No. 93. Quotas Amendment Ordinance	...	...
Government Notice No. 130. Sugar Industry (Price Stabilisation (Amendment) Regulations)	...	...
Government Notice No. 181. Production of Cane Requisition of Returns Order, 1951	...	...
Government Notice No. 288. Plant Protection (Amendment) Regulations	...	...
Council Paper No. 46 ...	...	...
	<i>VETERINARY</i>	
Gazette Notice No. 244. Veterinary Surgeons Register	...	Veterinary Surgeons Register
Gazette Notice No. 1032. Importation of Fish	...	...
Gazette Notice No. 1088. Importation of Fish	...	...
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Government Notice No. 15. Importation of Animals Regulation	...	...
Government Notice No. 22. Tuberculosis in Cattle and Goats Regulations	...	...
Government Notice No. 43. Diseases of Animals—Infected Areas	...	...
Government Notice No. 172. Importation of Hides and Skins Regulations	...	...
Ordinance No. 45. Dogs Amendment Ordinance	...	...

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